FOUNDRY TRADE JOURNAL

EST. 1902

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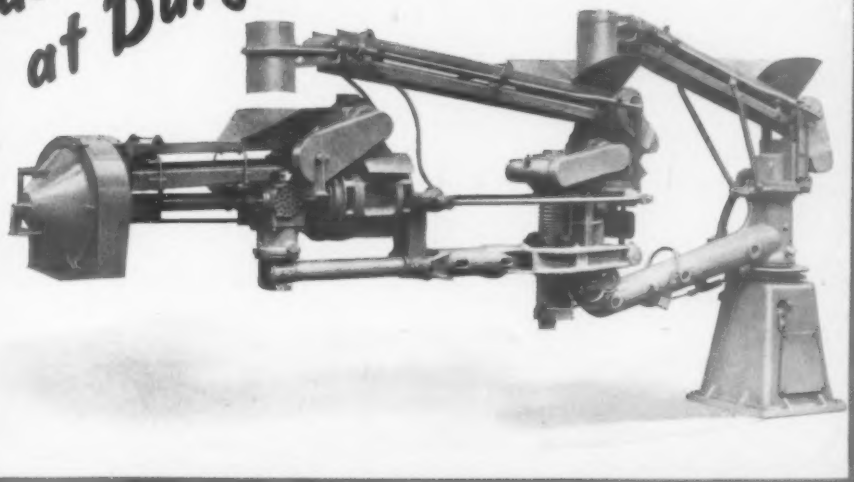
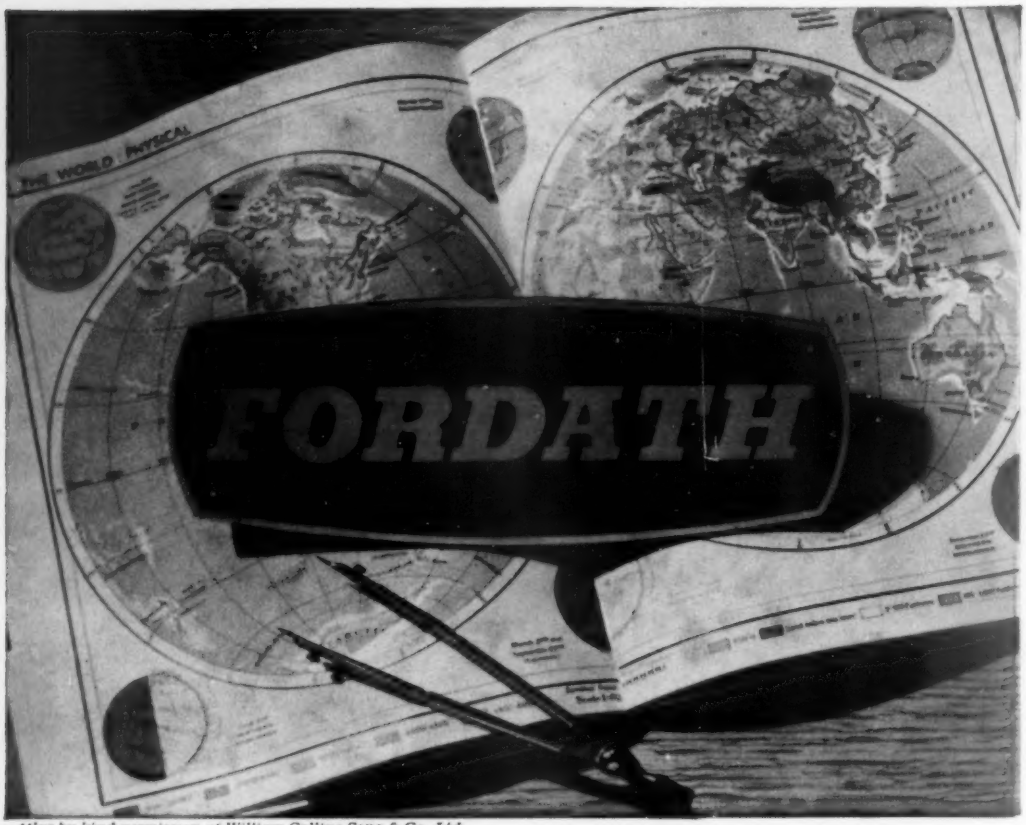
Sandslingers at Durgapur



STATIONARY TYPE SANDSLINGER
with arm raising and lowering gear

Sandslinger

FOUNDRY PLANT & MACHINERY LTD
EGLINTON WORKS, COOK STREET
GLASGOW, C.5.



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Sulphur	0.025	0.015
Phosphorus	0.025	0.025
Silicon	0.08	0.08
Manganese	0.009	0.009

RESIDUAL ELEMENTS

	%		%		%
Chromium	0.035	Titanium	0.020	Aluminium	0.015
Copper	0·025	Vanadium	0.025	Tungsten	0.001
Nickel	0.085	Cobalt	0·040	Molybdenum	0·001
				Tin	0.001

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A

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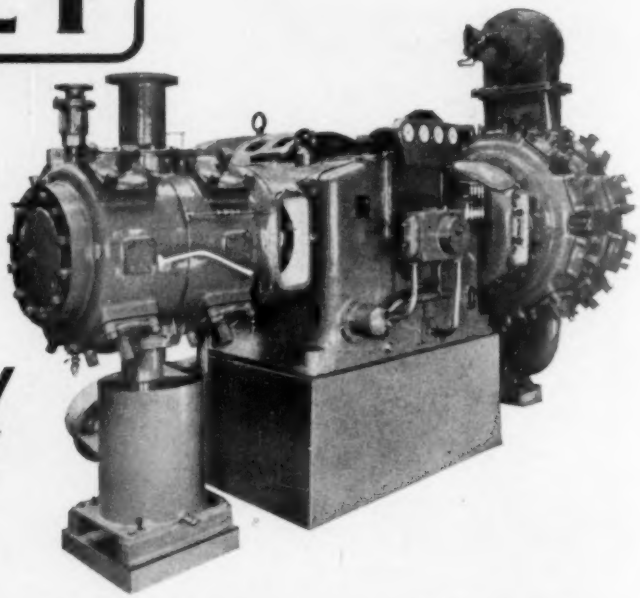

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are compact, fully balanced and vibration-free

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the pools

". . . and I might at that if a couple of teams I could mention were to buy themselves some decent centre forwards.

"Football is a funny game. One week a club is a world-beater and yet a few days later they can be licked to a frazzle by a team from a girls' school.

"Heaven help us if we carried on that sort of caper at AW. Customers don't want firms that are up one minute and down the next. When buyers come to a company with our reputation they expect—and get—a reliable performance. Fancy telling them that a load of pig wasn't up to specification because one of our furnacemen was off form!

"I reckon I'd get a coupon up every week if footballers were only half as consistent as the AW team."

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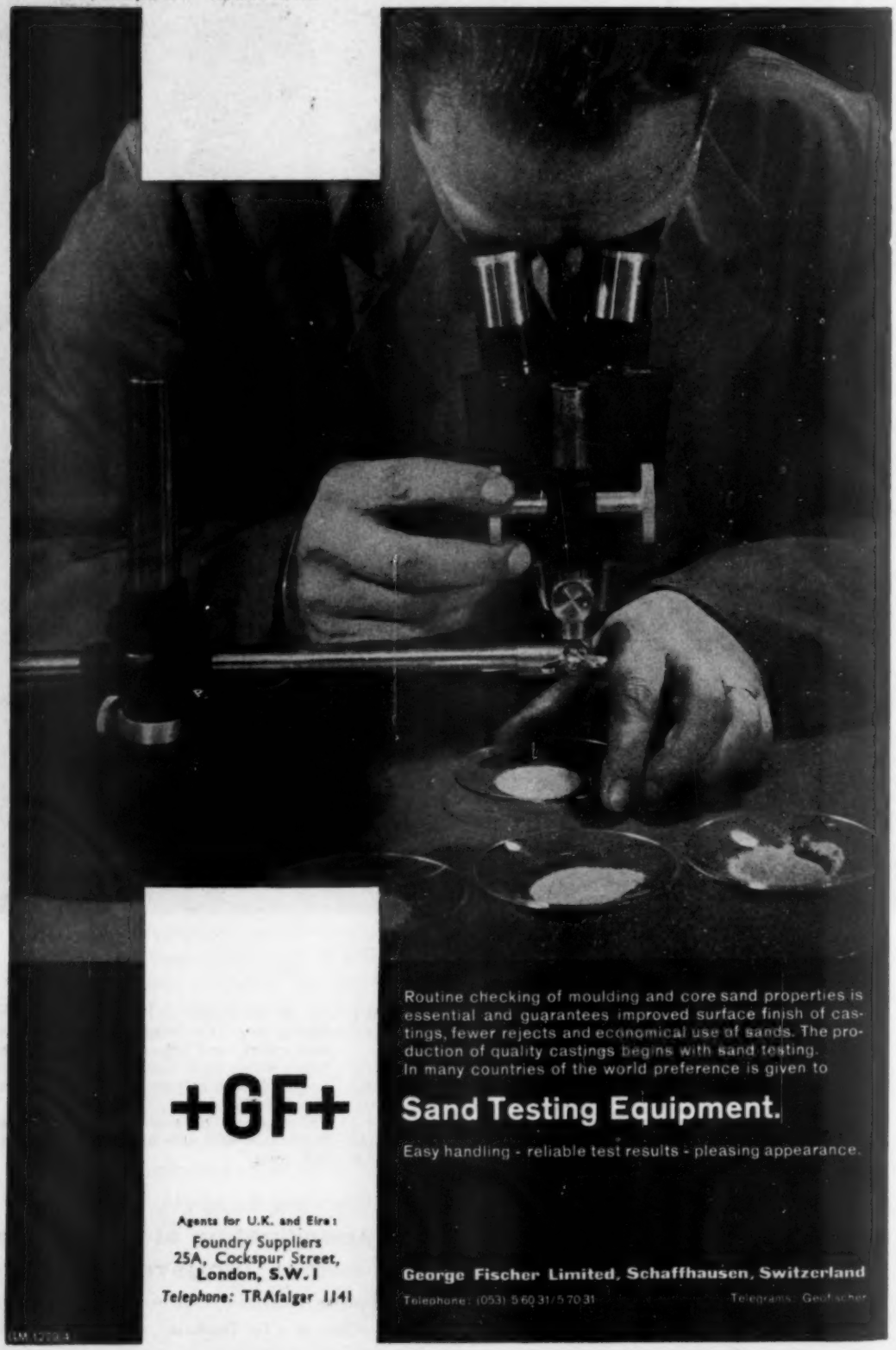
A2


Routine checking of moulding and core sand properties is essential and guarantees improved surface finish of castings, fewer rejects and economical use of sands. The production of quality castings begins with sand testing.
In many countries of the world preference is given to
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Easy handling - reliable test results - pleasing appearance.
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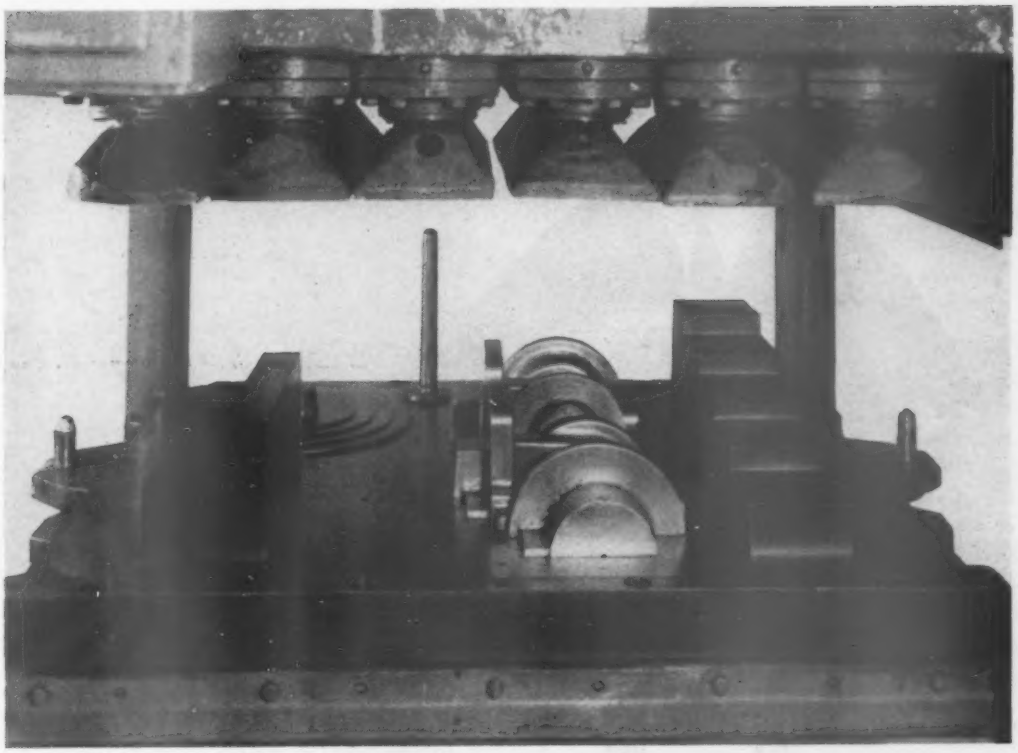

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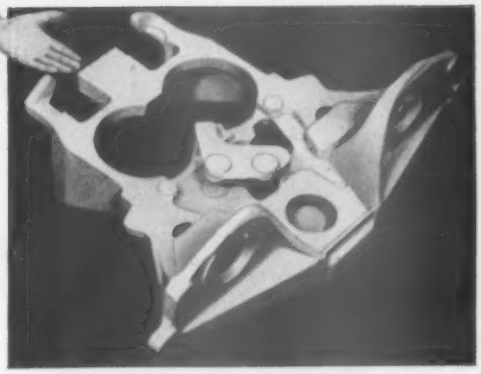
That's what I call PRECISION

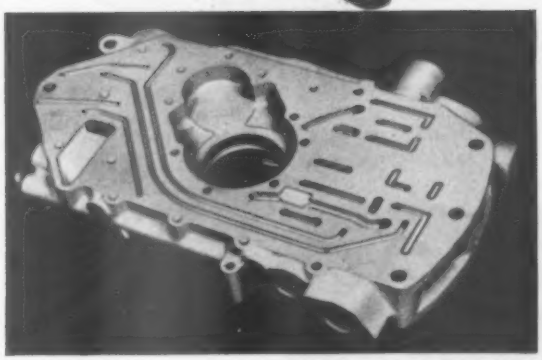


0·100″ wall thickness with pin-point accuracy.

Precision is vital in the casting of high performance electronic equipment. That's why

STERLING METALS LTD.

chose to use a THOR Shell-Moulding resin. (Size of casting: 7½″ long × 10″ at widest point—wall thickness 0·100″)



"as cast" and not machine finished.

Again, precision is the keynote of this automatic transmission part cast by

STERLING METALS LTD.

. . . again using a THOR Shell-Moulding resin. This casting is 14″ long × 7½″ wide. Slots are in "as cast" condition and not machine finished.

THOR
FOUNDRY RESINS

LEICESTER, LOVELL & CO. LTD.,
NORTH BADDESLEY, SOUTHAMPTON
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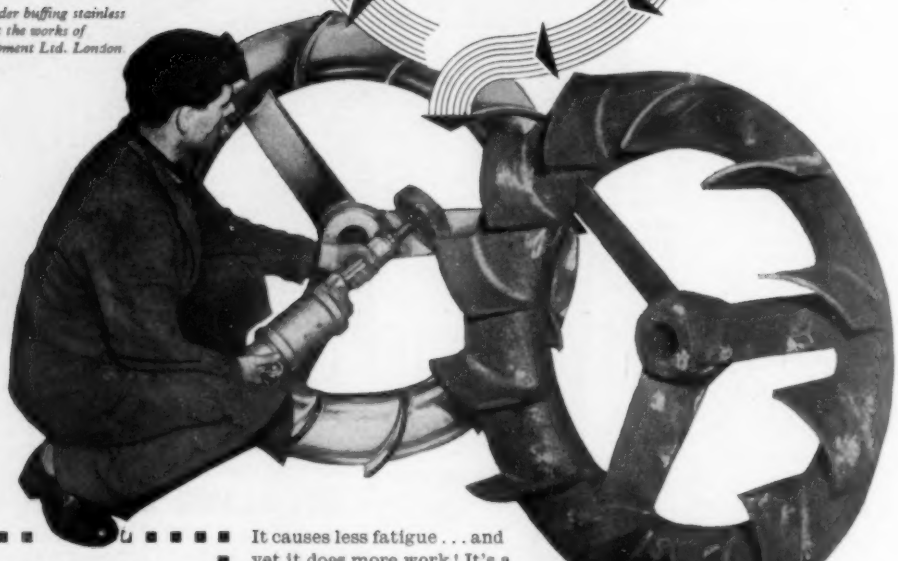
T.34

There's something special about this tool...



A Hicycle grinder buffing stainless steel castings at the works of Stainless Equipment Ltd. London.

Hicycle tools are of special interest to you—

Here's why...

- **INCREASED PRODUCTION** A constant speed is maintained irrespective of load.
- **REDUCED WEIGHT** High sustained motor speed gives increased power to weight ratio, and so makes for effortless operation.
- **LESS MAINTENANCE** There are no commutators, brushes or brush gear to maintain, and the squirrel cage rotor cannot burn out.
- **GREATER ECONOMY** A Hicycle tool uses only a fraction of the power of a comparable compressed air tool.
- **MORE SAFETY** The voltage to earth is only 72 volts—safer than tools operating on the usual 200/250 volts.

It causes less fatigue . . . and yet it does more work! It's a Hicycle electric tool, one of a wide range of heavy duty units which are pushing up production figures in many factories today. Its high performance is due to its constant speed under load. The tool does *all* the hard work which makes operation swift, smooth and effortless. The result is greater output . . . . improved finish. Ask for the Hicycle catalogue.

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CP158

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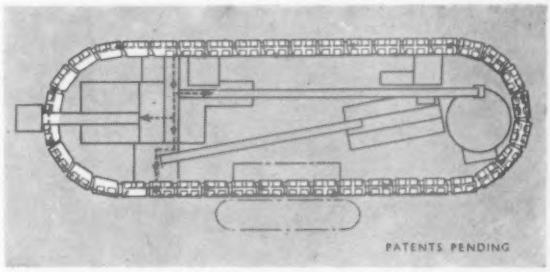
CLEVELAND 5, OHIO

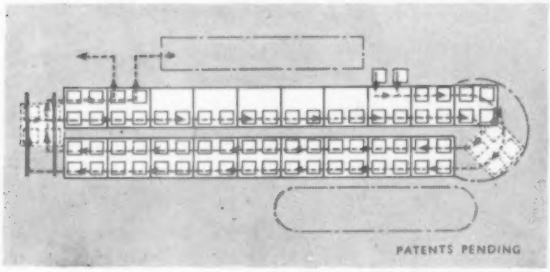
Mould Handling Systems

Unique and Practical

"Double MLC" Mould Handling System

Snap or tight flask moulds are set out in outside position on the car, poured, and travel almost completely around the loop. They are then transferred automatically to inside position on the car, and continue around the loop again for automatic removal at the shakeout. These new systems provide almost twice the cooling time of a conventional mould conveyor carrying only a single line of moulds; effecting substantial savings in floor space, equipment, building, and other facilities.



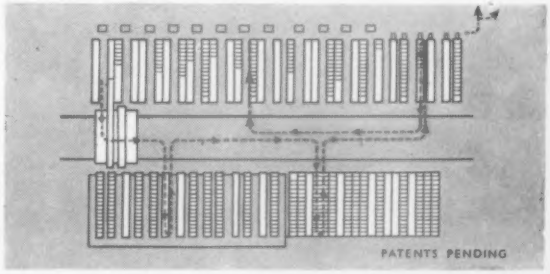


"Double MRI" Mould Handling System

Rectangular loop, consisting of two straight runs connected with a rotary turn and transfer car. Cars advance one car length, then remain stationary for timed period so large moulds can be loaded onto the conveyor, poured, and the moulds removed, while the conveyor is stationary. Moulds are carried side by side on the cars and make almost two complete trips around the loop, thus nearly doubling the cooling time per square foot of floor space.

"MF" Mould Handling System

Unlimited flexibility for jobbing foundries. The transfer car delivers pallets loaded with similar moulds, to the pouring, cooling, and shakeout zones, and returns the pallet with the bottom boards and bands—or flasks—to the moulding area. Handling similar moulds together permits moulds for different castings to be kept separate, and even poured with different metals, without interfering with other groups of castings. Slow jobs do not hold up the fast jobs. Moulding, pouring, cooling and shakeout are centralized, minimizing the equipment requirement.



Write today for a copy of Bulletin No. 135. It gives full details about eight different types of Bartlett-Snow Mould Handling Systems.

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ACME CHAMBERS, BRADFORD STREET, WALSALL

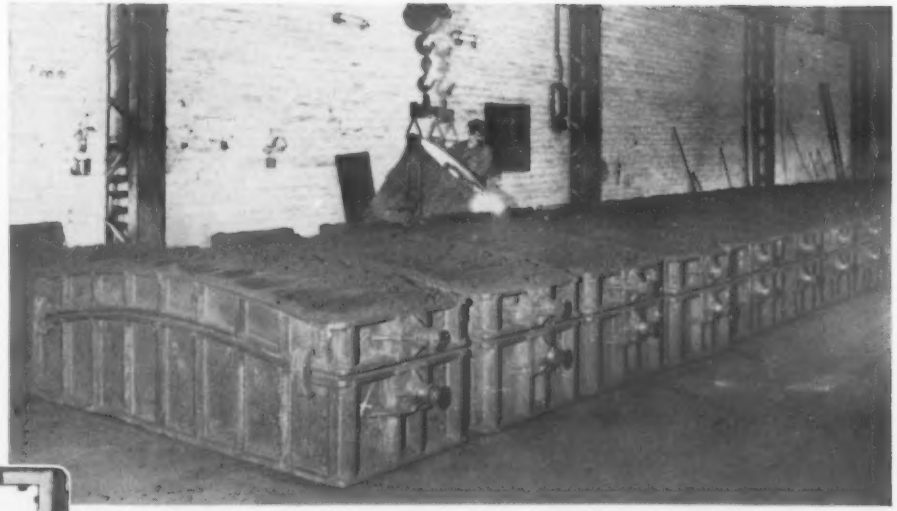
GLASGOW AND HILLINGTON

GLASGOW SOUTH 2875 · WALLSALL 27444-5

A3

Sterling boxes in a world-famous foundry

At the Carron Company's world-famous foundries at Falkirk, tunnel segments for the new Linthouse-Whiteinch Tunnel under the Clyde are now being cast in Sterling rolled steel moulding boxes. The weight of the castings is approximately 15 cwt. per section and the box dimensions are 30in. by 95in., cope 9⅛in. deep and drag part 22⅛in. deep.



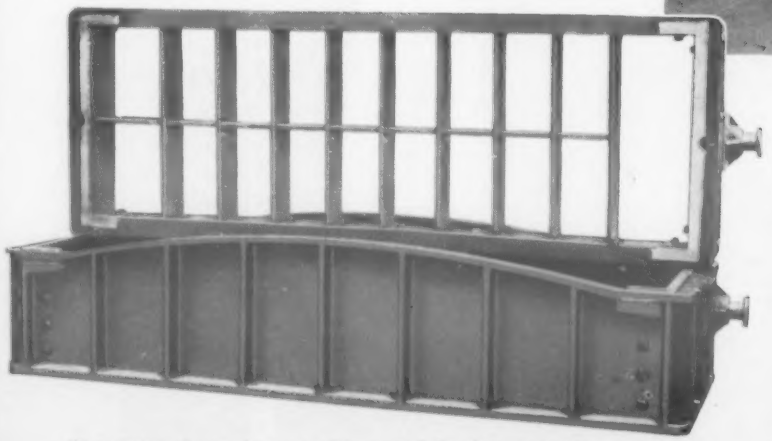


Illustration shows the type of box used for this operation.

618 Cogent

Sterling MOULDING BOXES

STERLING FOUNDRY SPECIALTIES LIMITED, BEDFORD.

FOCUS ON 'FULBOND'

Nº5

Permeability

This property is of prime importance to all foundrymen especially those using a naturally bonded moulding sand. In synthetic sands Fulbond gives all the permeability that can be desired.

The initial permeability of natural sands is usually adequate for the first few moulds but soon begins to show a serious decline, resulting in a series of casting defects. Addition of new sand to increase permeability does not always have the desired effect, since after each casting cycle there is a progressive build-up of inert fines from the various decomposed minerals. It therefore becomes increasingly difficult to raise the permeability of a moulding sand even with large quantities of new natural sand.

Because so little Fulbond is required to regenerate moulding sand, the clay content can be kept at a minimum thus giving maximum permeability.

Moisture content has great influence on permeability. Natural sands require much more water than synthetic sands because of their relatively higher content of clay and fines. If the moisture can be kept down, permeability is automatically raised. Fulbond is most efficient at low to medium moisture, so it is clear how useful it is in controlling permeability.

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CYLINDER AND HIGH DUTY CASTINGS

The perfect pig-iron for cylinder and high duty castings . . . free from porosity and of high tensile strength. Our Technical Staff is always ready to assist users and to advise with regard to mixtures. We cordially welcome your enquiries.

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A4

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NEW FORD CONSUL CLASSIC CRANKSHAFT

cast in FESLENTE RESIN-COATED SAND

Write for Technical Bulletin No. 10

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Designed and manufactured for collecting fine particle dust

A unique and highly efficient Wet Separator has been developed by Cleanair Ltd. It has the following advantages:-

1. **HIGH EFFICIENCY**
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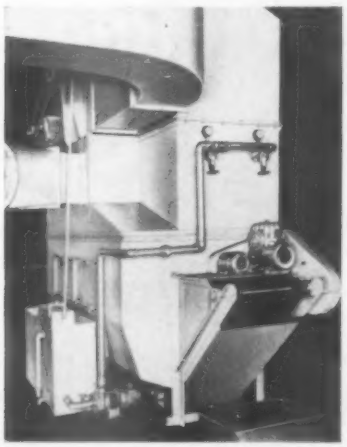
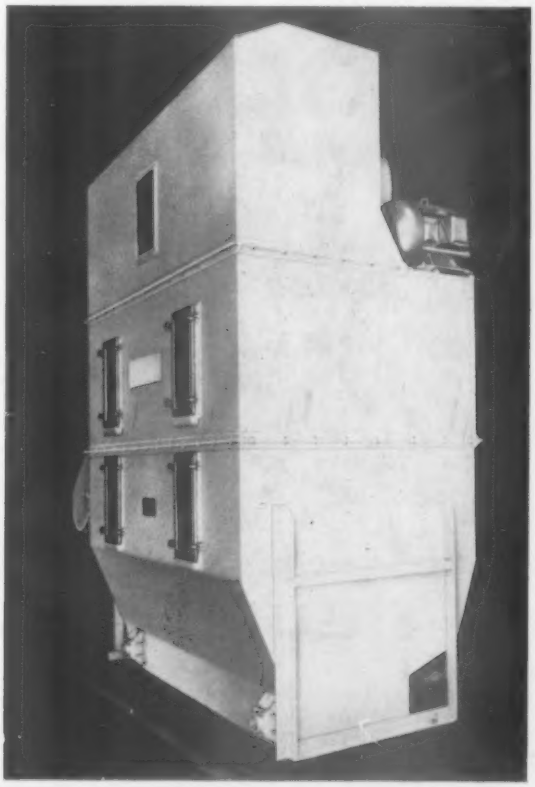
3. **MECHANICAL SLUDGE EJECTION**
4. **MINIMUM MAINTENANCE**





Our Engineers will be pleased to discuss the economic and operational advantages of this new Separator. Please write for details.

Photographs by courtesy of Foundry Equipment Ltd.

CLEANAIR LTD

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LIMITED

VENTILATING, DUST & FUME EXTRACTION ENGINEERS

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AND "ALUMISH" FOR ALUMINIUM
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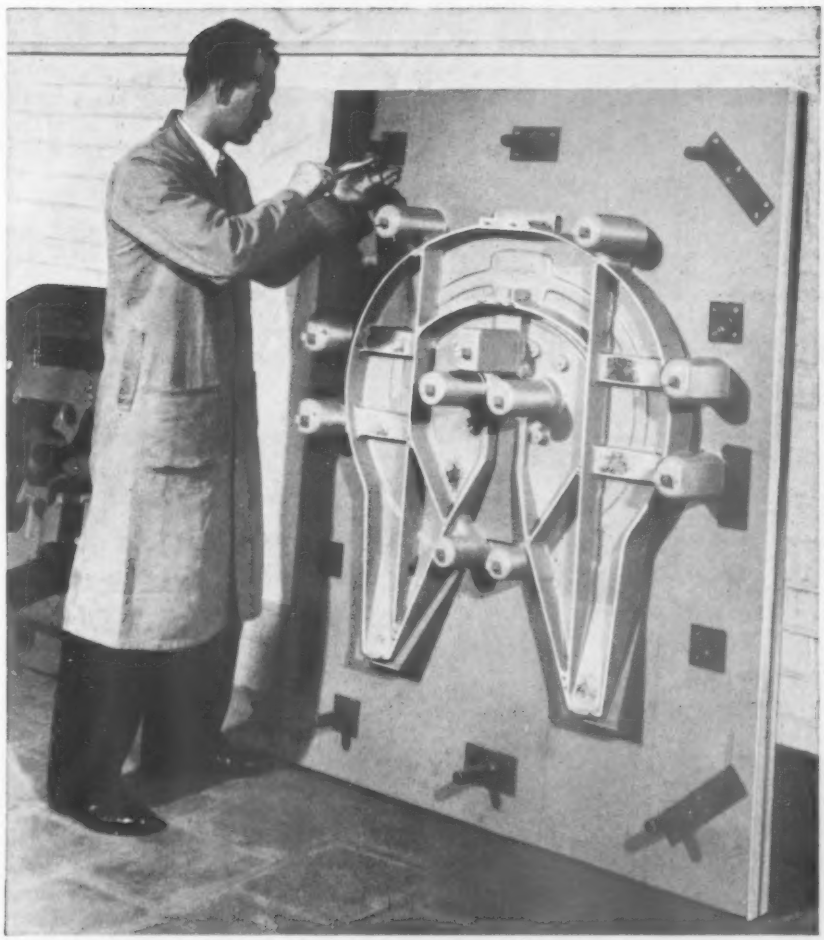

Standing up to it

This pattern for a fifth wheel steel casting required by Scammell Lorries Limited was made at the Leyland Motors Limited steel foundry at Farrington. It was made in Araldite casting resin because wood patterns could not withstand constant use on moulding machines. Araldite casting resins permit the speedy and economical production of any number of replica patterns, enabling the master pattern to be preserved. These duplicates are exact to size, as there is no shrinkage during setting, and no allowance for 'double reduction' is necessary. The patterns are tough, durable and not easily damaged, and do not deteriorate in store. Furthermore, modifications can easily be made, using the same materials. May we send you details of 'Araldite' epoxy resins for foundry patterns?

Araldite epoxy resins are used:—

for casting high grade solid electrical insulation

for impregnating, potting or sealing electrical windings and components

for producing glass fibre laminates

for producing patterns, models, jigs and tools

as fillers for sheet metal work

as protective coatings for metal, wood and ceramic surfaces

for bonding metals, ceramics etc.

ARALDITE EPOXY RESINS

Araldite is a registered trademark

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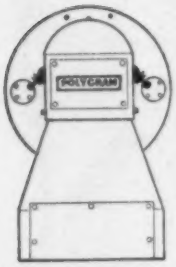
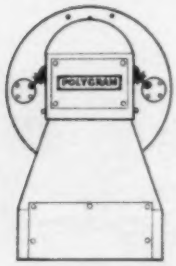
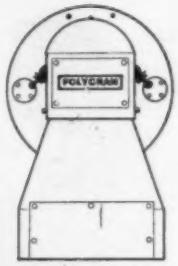
AP 651



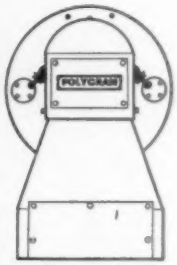
SHELL COREMAKING



SHELL MOULDING

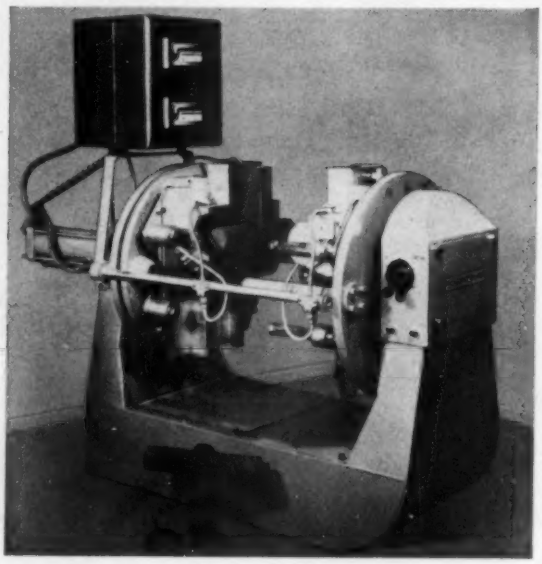


HOT-BOX PROCESS



GRAVITY DIECASTING

ONE . . . Polygram MANIPULATORS for SHELL COREMAKING



Polygram Manipulators are the ideal method for handling large shell coreboxes (up to a maximum size of 28in. by 18in.) since they offer the following advantages:—

Full pneumatic operation from closing box to ejection of core.
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Temperature of each half of corebox electrically regulated within $\pm 5^{\circ}C$.
Can be used with existing core blowers or shooters.
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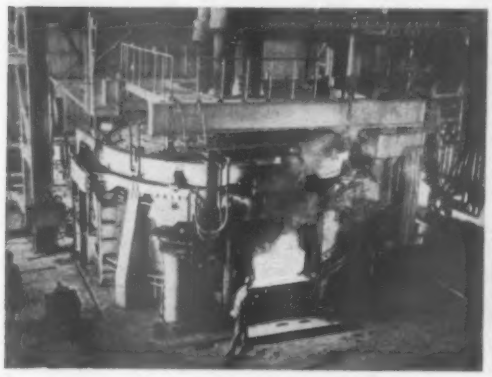
Technical improvements evolved over many years with the installation of over 2,800 units are incorporated in the G.W.B. British built Arc Furnaces now being built to Demag and Lectromelt designs. When you discuss Arc Melting Furnaces with G.W.B. the most suitable furnace for your production programme and shop layout will be suggested from the wide range of designs available. Let G.W.B. advise you on your steel melting problems.

G.W.B. Lectromelt 36,000 kVA Steel Melting Arc Furnace with 24' 0" diameter shell



G.W.B. Demag Submerged Arc Ferro-Silicon Smelting Furnace

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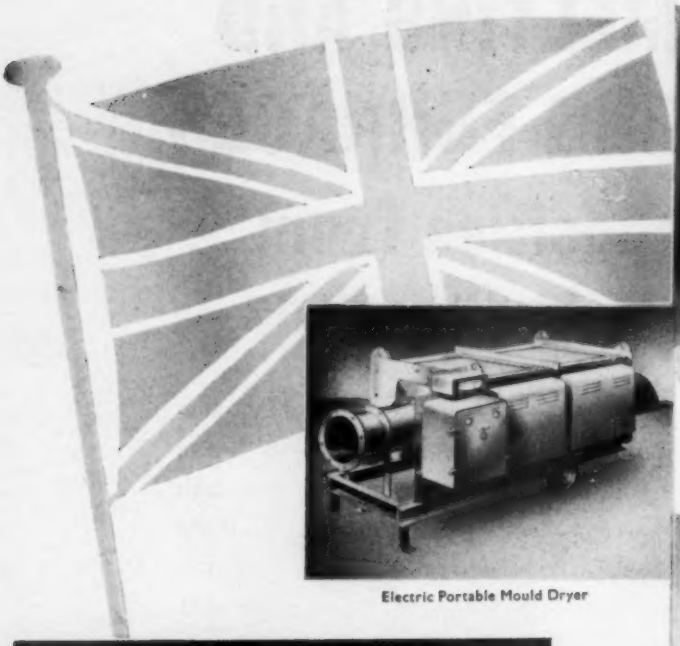
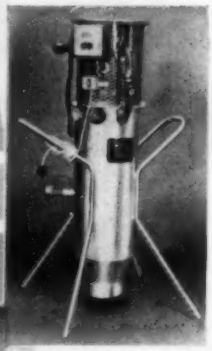




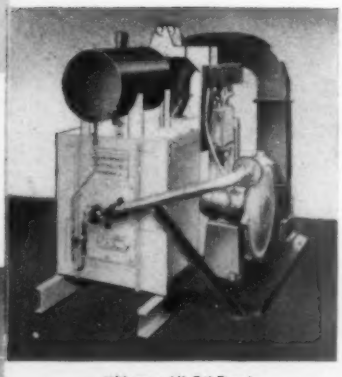
Axia Jet — M Gas Fired

Electric Portable Mould Dryer

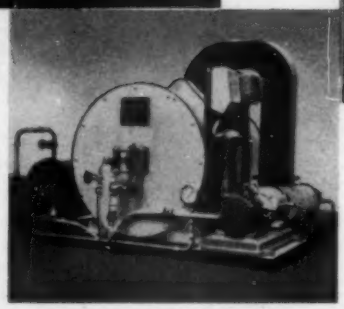
'NEWSTAD'

PORTABLE MOULD DRYERS

—for Economy
—Efficiency
—Reliability



"Newstad" Oil Fired



"Junior" Oil Fired

Manufactured only by the Foundry Drying Equipment Specialists

MODERN FURNACES and STOVES LIMITED

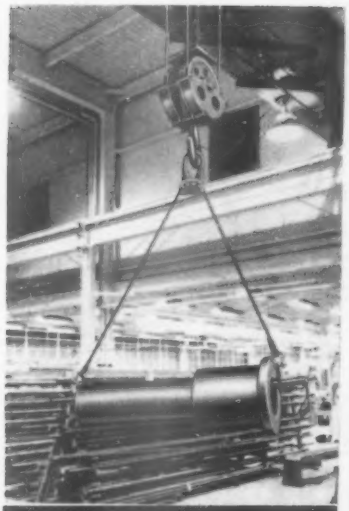
Builders of INDUSTRIAL FURNACES

BOOTH STREET, BIRMINGHAM 21. phone: SMEthwick 1591-2 grams: Mofustolim, B'ham 21

OVERSEAS AGENTS

Drew Brown Limited, 5410 Ferrier Street, Montreal, 9. Canada.
Fenter (Africa) (Pty), Ltd., P. O. Box 6738, Johannesburg South Africa.

8.219



FELCO
LIFTING APPLIANCES

"ADJUST-A-LEG" EQUALIZING SLINGS

WORLD PATENTS APPLIED FOR

"TWO SLINGS IN ONE"

The **ADJUST-A-LEG** Equalizing Sling is ideal for handling balanced and unbalanced loads efficiently, speedily and with complete safety. When the sling legs are secured to the load and lifting starts, the sling legs lock automatically. Should many identical loads be lifted, fixed sling leg lengths are desirable, this is arranged for by a simple adjustment.

The Felco **ADJUST-A-LEG** Equalizing Sling is available in capacities from 1 to 20 tons.

Write to-day for leaflet.

FELCO HOISTS LTD.

29 CROMWELL RD. · LONDON, S.W.7.

'Phone: KENSINGTON 7401 (3 lines) *Telex 24118* *'Grams:* 'FELCOHOIST', London, Telex.

F1

HOT NEWS FOR HOT BOX EXPERTS

New Cellobond phenolic resin improves the 'hot box' process

1 No hardener is needed—
the mix is cured by heat alone.

2 No metal/mould reaction.

3 No unpleasant odours.

Experts in 'hot box' core blowing should contact the experts in phenolic resins at the address below and find out more about Cellobond Foundry Resin J.1011

CELLOBOND *is a reg'd trade mark*

British Resin Products Ltd A COMPANY IN THE DISTILLERS PLASTICS GROUP BRP

SALES AND TECHNICAL SERVICE DEVONSHIRE HOUSE PICCADILLY LONDON W1 HYDE PARK 0151

Distillers Plastics Serve Everyman

we supply

more than just ingots.
You also get the highest standard of consistency and purity that skilled laboratory testing and modern purification techniques can attain — coupled with really fast delivery. For Non-Ferrous ingots to British Standard Specification or to special analysis consult:

Park and Paterson Ltd.

INGOT MANUFACTURERS

Established 1872

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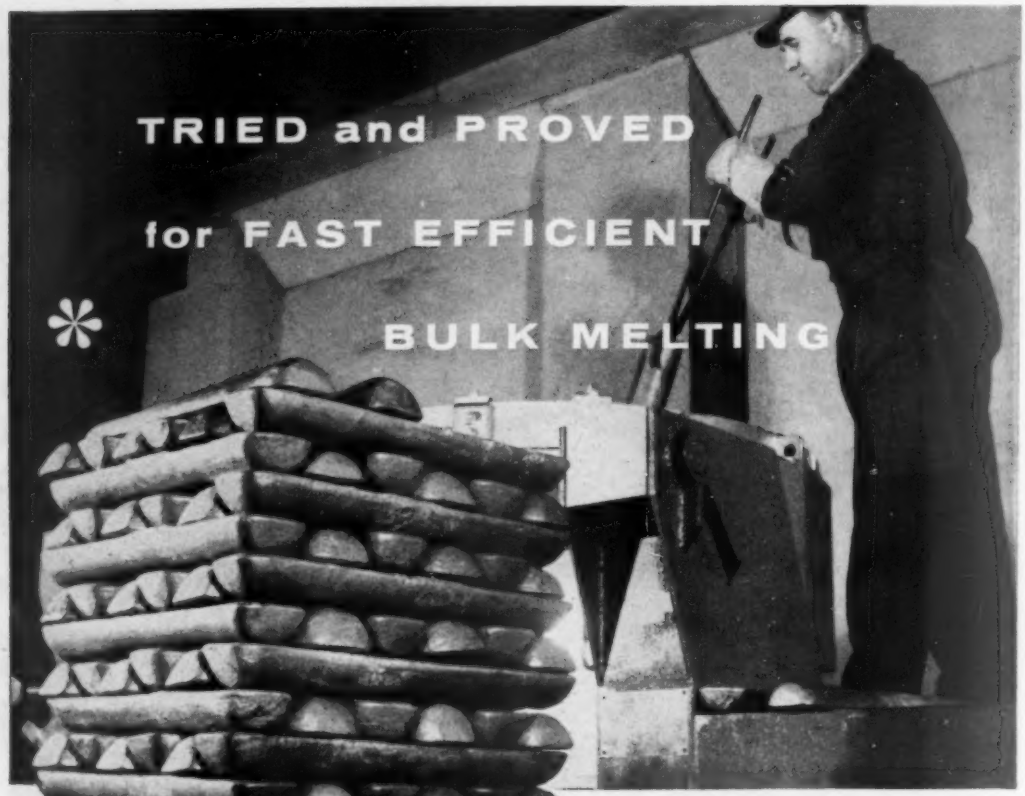
MARPLE, STOCKPORT, CHESHIRE. *Telephone:* MARPLE 1422-3

GLASGOW
PARKHEAD, GLASGOW, E.1. *Telephone:* BRIDGETON 4451-2



MORGAN

BASIN TILTERS

*The new BT-1300 takes only 60 minutes to melt all this Aluminium Alloy

During the past eighteen months 54 Morgan Basin Tilters have been installed in modern foundries for fast and economical bulk melting of a wide range of high quality aluminium or copper based alloys.

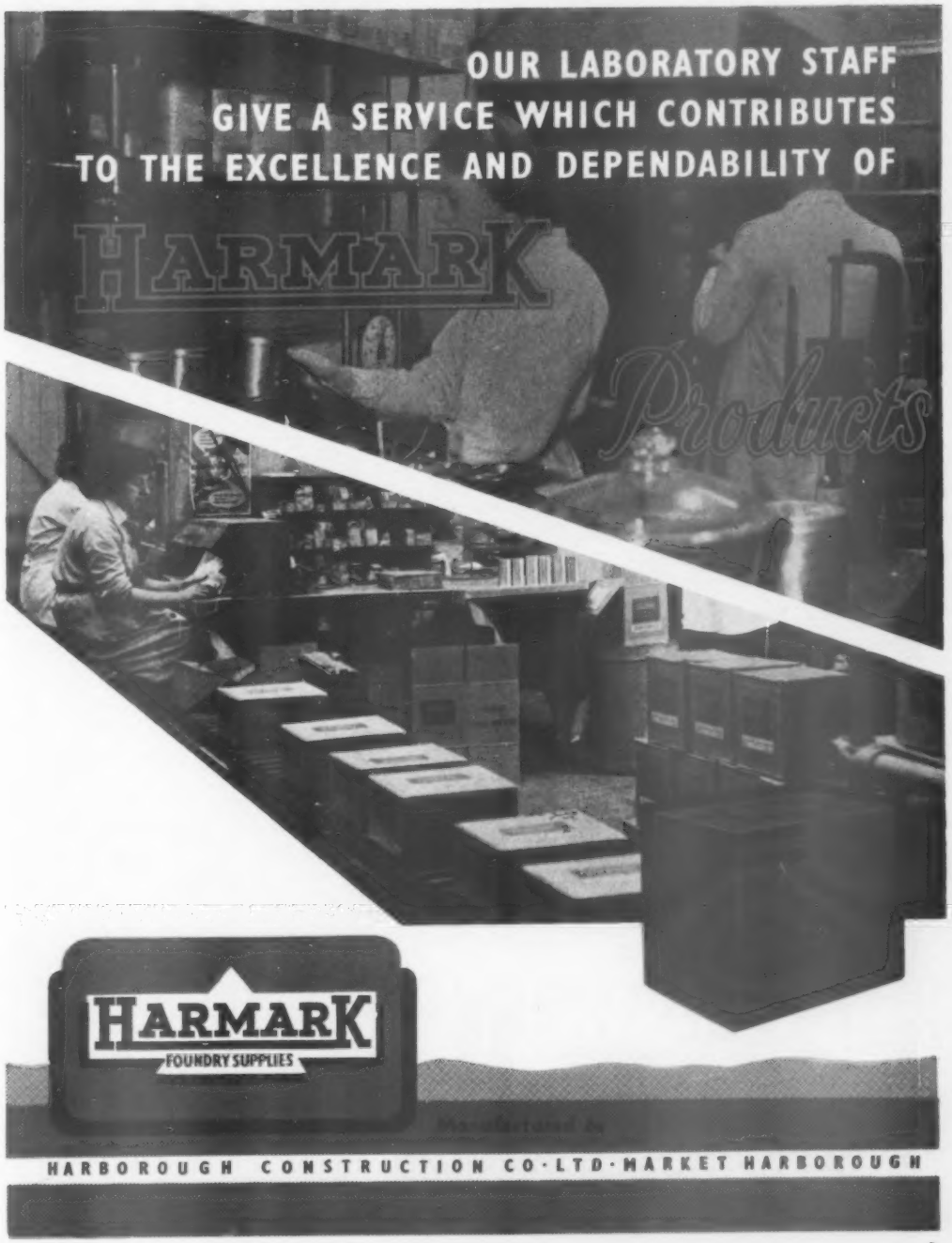
For top quality castings and lowest melting loss, invest in the most flexible of all bulk melters. Ask for a demonstration, with your own metal if preferred, at the Battersea Test Foundry.

MORGANITE CRUCIBLE LIMITED, NORTON WORKS, WOODBURY LANE, WORCESTER. Tel: Worcester 26691 Telex: 33191

A Member of The Morgan Crucible Group.

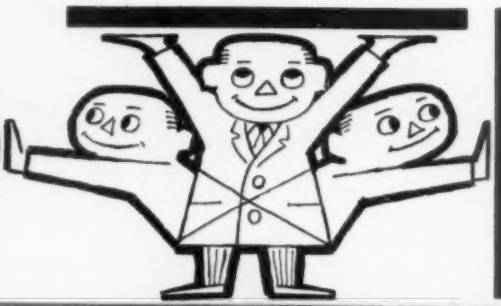
F54A

UNSEEN BUT UNCEASING...

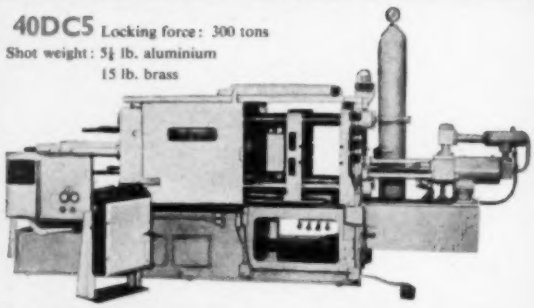


B

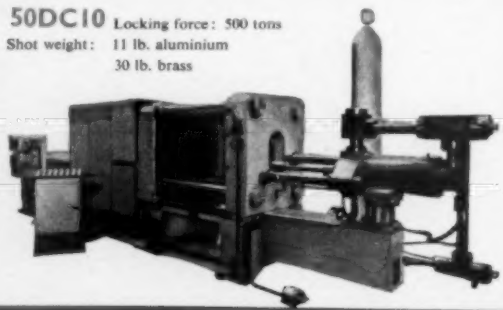
PECO TRIO



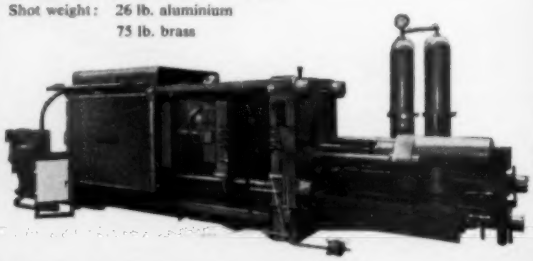
40DC5 Locking force: 300 tons
Shot weight: 5½ lb. aluminium
15 lb. brass



50DC10 Locking force: 500 tons
Shot weight: 11 lb. aluminium
30 lb. brass



60DC20 Locking force: 750 tons
Shot weight: 26 lb. aluminium
75 lb. brass



PRESSURE DIE-CASTING MACHINES NOW WITH *HIGH SPEED INJECTION*

and incorporated in every Peco Die-Casting Machine

TWO-PHASE INJECTION

ADJUSTABLE OPENING STROKE

RECIRCULATION TO ELIMINATE CAVITATION

INSTRUMENTATION INDEPENDENTLY HOUSED

HYDRAULIC ACTION THROUGHOUT—ELECTRICALLY SELECTED

PECO PRODUCTS

Write or 'phone for a set of PECO "World Standard" Specifications

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HEPBURN • Pangborn

Solve the Problem

This company produces a diversity of castings in alloy iron and hematite iron. These include ingot moulds for the steel industry, brake drums and liners for Public Passenger vehicles, machine tool castings, gear wheel blanks, Colliery castings and General Engineering castings. The problem here was to find a suitable Shot Blast Machine to clean castings from one pound to two tons at lowest total cost and to speed production.

for **ALLOY STEEL & IRON CO · CHESTERFIELD & SHEFFIELD**

THE SOLUTION . . .

After seeing the Pangborn LK 6ft. Rotablast at the 1958 Foundry Exhibition they decided to instal this machine to replace an Airless Rotary Barrel which was limited to size and weight of castings it was able to clean.

THE RESULTS . . .

1 Machine easily installed.
2 No Foundations required.
3 All Castings produced are now cleaned by machine.
4 50 per cent. increase in Output is now cleaned by same number of operatives.
5 No Breakages of Thin Castings.
6 Considerable saving of shot.
7 Fettling keeps pace with output.
8 Perfectly clean Castings to customers on time.

Blasting time three minutes

HEPBURN CONVEYOR Co. Ltd.

Telegrams: CONVEYORS
Tel. Nos. 3695/6 & 7
WAKEFIELD, Yorks.

A load leaves Tamworth

every 20 minutes

Each working hour, a further 25 customers take delivery of Foseco Products Each week, hundreds of tons of carefully prepared and packed finished products are despatched from the Foseco Works at Drayton Manor, Tamworth.

Areas of regular deliveries are shown in the map below. The red areas are serviced by Foseco's own transport fleet; the black shaded areas by contract vehicles and the remainder of the U.K. is served by British Road Services and British Railways.

In addition to regular services, arrangements are made for bulk deliveries to customer's requirements. Foseco delivery is planned to meet growing demand as promptly as the manufacture of superior quality products will permit.

WORLD WIDE SERVICE FOR FOUNDRYMEN

Regular loads leaving Tamworth include these Foseco Products: Covering Fluxes, Degassers, Grain Refiners, Deoxidants, Aluminium Removers, Magnesium Removers, Cupola Fluxes, Ferro Alloy Briquettes, Alloy Ladle Additions, Scavengers, Inoculating Compounds, Feeding Compounds, Diecasting Fluxes, Mould and Core Coatings, Die Dressings, Ingot Dressings, CO_2 Process Binders, Core Adhesives, Casting Plasters, Pattern Plasters, Refractory Washes and Core Breakdown Agents.

Foseco★

★ Registered Trade Marks

THIS IS *the tool*
FOR INCREASED PRODUCTIVITY

Write for leaflet W.F. 181 showing full range including Floor Rammers.

The design of this Rammer is based upon the accumulative experience gained from years of practical use. and its application results in quicker and more firmer packed moulds.

R28.

CHIPPING HAMMERS • GRINDERS

FOUNDRY RAMMERS • HEAD CUTTERS

Thor POWER TOOLS

THOR TOOLS LTD.

NEW COMPANY NAME OF ARMSTRONG WHITWORTH & COMPANY (PNEUMATIC TOOLS) LTD

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. . . for COMPLETE MONOLITHIC LININGS · MOULDING SPECIAL SHAPES REPAIRS TO BRICKWORK

	How Supplied	Type of Set	Methods of Use	Refractoriness	Thermal Hardening Temperature	Maximum Temperature of use	Approx. weight required per cubic foot lbs.	Approx. weight required per cubic metre kgs.
Maksiccar Plastic	Plastic	Heat Setting	Hand moulding or patching	1730°C	900°C	1580°C	140	2243
Stein Sillimanite Patch	Plastic				1000°C	1700°C	155	2483
Stein 73 Plastic	Plastic			+ 1750°C	1000°C	1800°C	180	2884
Maksiccar Fire Puffy	Plastic	Air Setting	Hand moulding or patching	1350°C	500°C	1100°C	140	2243
Stein Chrome Patch	Semi-Plastic			+ 1750°C	600°C	1500°C	200	3204
Maksiccar Patch	Plastic		Ramming or patching	1600°C	600°C	1550°C	135	2162
Stein 73 Patch	Semi-Plastic			+ 1750°C	600°C	1800°C	175	2804
Stein Magnesite Ramming Mixture	Dry			+ 1750°C	1400°C	1750°C	175	2804

For further details of the full range of Plastic Refractories, Refractory Cements and Castable Refractories, ask for Pamphlet No. 4.

Our technical department are also available to advise on suitability of application and correct ramming procedure.

JOHN G. STEIN & Co. Ltd., Bonnybridge, Scotland. Tel: BANKNOCK 255 (4 lines)

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OF CAST ROTOR VANES FURNISH

POWER

FOR THOUSANDS OF AMERICAN

GAS TURBINES

NOW YOU CAN SERVE INDUSTRY BY PROVING THE MERIT OF

CAST SUPERALLOYS

IN ROTATING MEMBERS

In America, the gas turbine could not have reached its current state of development without cast rotor vanes. English designers, too, should be specifying castings—YOUR castings. We'll supply the technical data and, we hope, the alloys.

WAINMET ALLOYS CO.

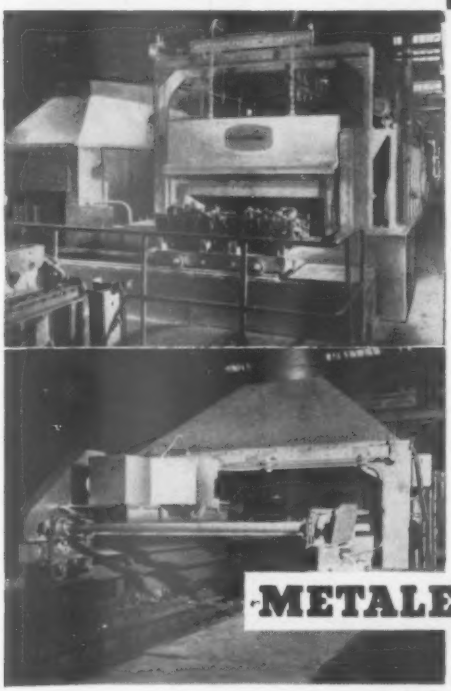
1999 GUOIN STREET • DETROIT 7, MICHIGAN • U.S.A.

STAINLESS STEELS • TOOL STEELS • SUPERALLOYS • VACUUM-MELTED ALLOYS

METALECTRIC

MALLEABLIZING CONTINUOUSLY

PEARLITIC AND FERRITIC MALLEABLE FROM THE SAME PLANT



Equipment for continuously producing ferritic and pearlitic malleable has been in operation for over four years, and the Metalectric plant installed at the Dagenham Works of The Ford Motor Co. Ltd., provides ample proof of the reliability of this form of annealing. The high degree of anneal coupled with ease in handling and the provision of a completely automatic plant emphasizes the consistency and uniformity of results which can be obtained by this process. Subsequent installations in the course of manufacture for Gloucester Foundry Ltd. and G.K.N. (Cwmbran) Ltd., include more up-to-date features, providing the latest form of continuous annealing.

Top: Charge end.
Upper left: Discharge end and return conveyor.
Lower left: Intermediate forced cooling station.

METALECTRIC FURNACES LTD.
SMETHWICK · ENGLAND
for all forms of electric heat treatment equipment.

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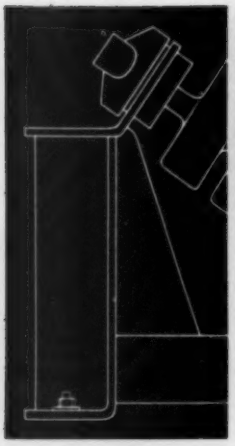
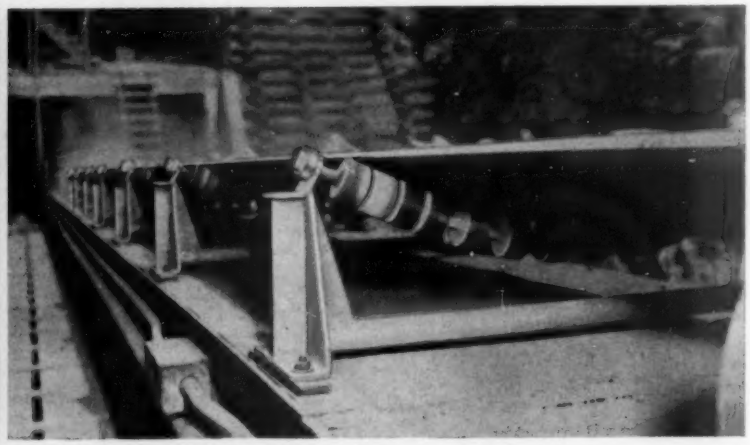
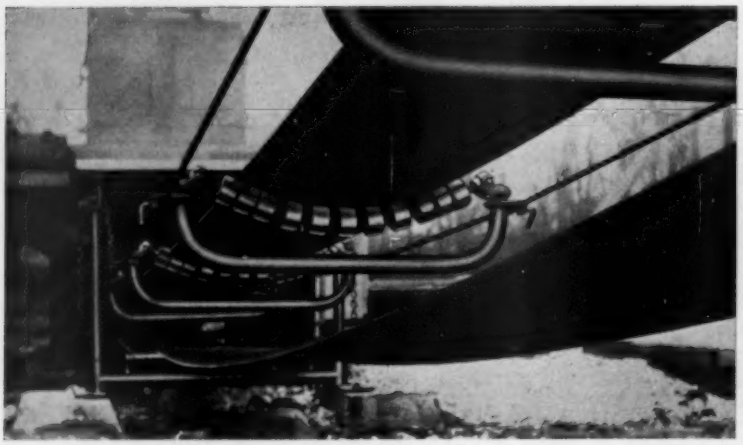
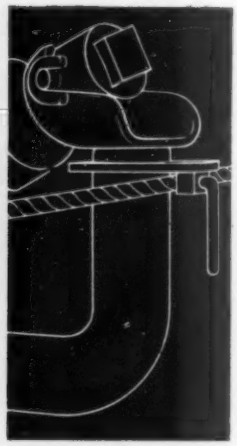


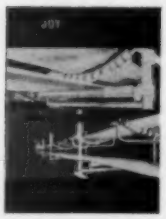


TWO SAVING WAYS WITH BELT CONVEYORS





JOY LIMBEROLLER IDLERS & LIMBEROPE CONVEYOR STRUCTURE



For the permanent structure—Joy Limberoller; a flexible conveyor idler that shapes itself to the load and can handle any bulk material transported by belt conveyors. It's saving? Because Joy Limberollers consist of hard wearing Neoprene discs moulded onto a flexible steel cable they exercise a self-cleaning action that saves belt and idler from damage, caused by material build-up under the belt. They cut spillage by giving a bump-free ride and need no maintenance. Joy Limberope conveyor structures offer all the savings of the Joy-Limberoller plus easier and faster set-up, dismantling and relocating. They give a well-trained belt, are low in first cost... maintenance cost, and are easily transported from site to site. Savings indeed for any thrifty belt conveyor user!

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Bulletin CO/361 with full details will be sent on application to:- **Joy-Sullivan Limited 7 Harley Street, London W.1.** or any of the following Distributors :—

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Streamlined in design and robustly constructed, these two machines from Robinson's famous Cadet range ensure the fine, precise workmanship essential to pattern making. They will maintain highest standards of accuracy throughout a lifetime of service. Full details of these and other machines in the Cadet Range are available on request.

(*Bottom picture*)
EV/T 16in. × 9in. Single Cutterhead Panel Planer & Thicknesser

(*Top picture*)
YF/T 9in. Hand Feed Surfacer

Robinson Cadet

WOODWORKING MACHINERY

—for a better class of work

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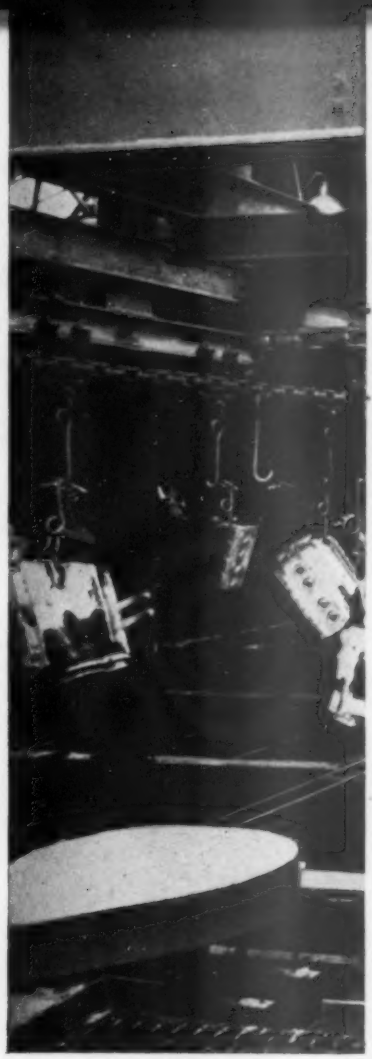

how many men . . . do you employ

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Mechanical Handling Engineers & Crane Makers, Specialists in Foundry Mechanisation

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Glasgow :	Wyndford Works, Maryhill, Glasgow N.W. Phone : Maryhill 2172-5
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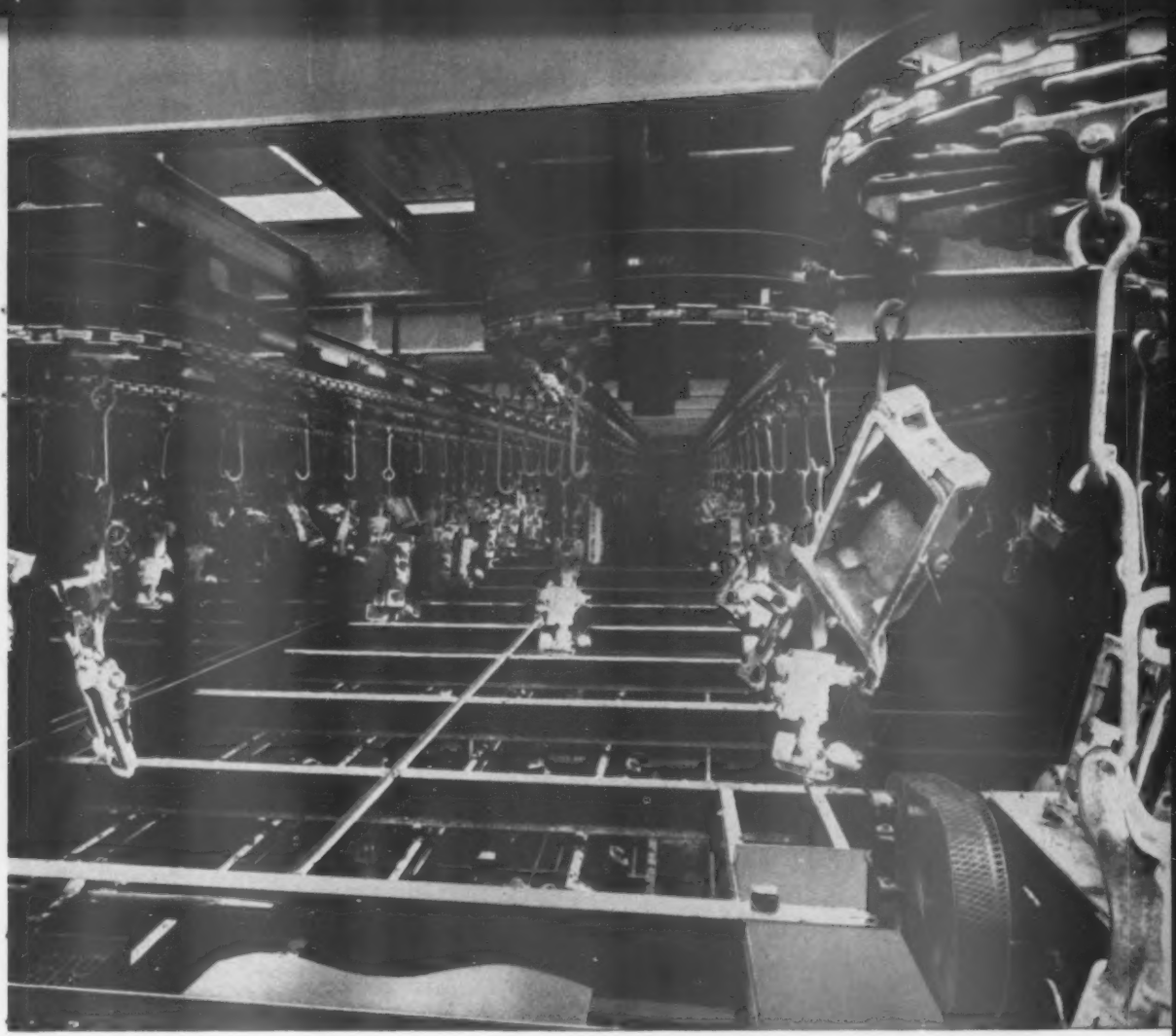
Enquiries may be sent to any of the above offices.

Also at Bristol, Manchester, Newcastle, India and South Africa



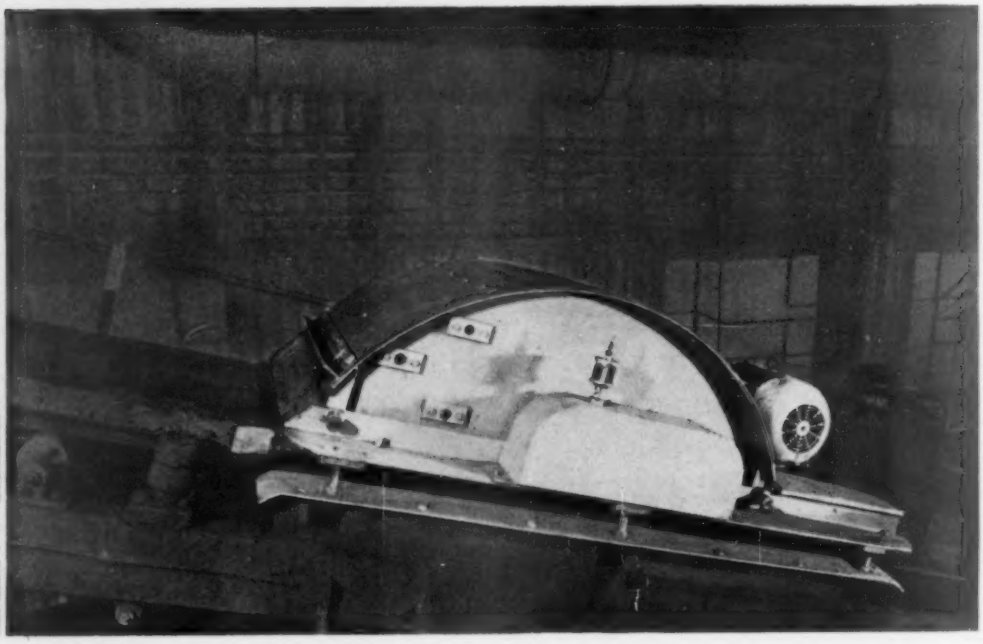
to move your materials?

Far more than appear on your payroll—if you have a Paterson Hughes conveyor scheme or mechanical handling installation. Behind every Paterson Hughes plant, there stand the sales engineers, designers, fabricators, installation engineers and service engineers, whose job is to move your materials and your products as cheaply and efficiently as possible, and to put at your disposal the complete advisory services of a specialist company.

P6031

Announcing the C.B.M.

PROVED · PRACTICAL · PRICE CONSCIOUS!



First introduced at the American Foundry Show, Cleveland, in 1958, several of these Aerators have been tried out in various foundries and now we offer them to *you!* We have always been able to offer an efficient Aerator or Disintegrator for any capacity. Now the C.B.M. has arrived !
The C.B.M. Aerator, for which British and Overseas Patents are pending, has these features—

- **Available for any hourly sand capacity up to 100 tons per hour.**
- **Suitable for mounting over any width of flat belt conveyor.**
- **Can be incorporated in plants of our own design or in any plant, by anybody, anywhere.**
- **Can be used in new or existing installations.**
- **All you need is a flat rubber conveyor belt on the distribution side of the Sand Plant.**
- **Can easily and quickly be fitted with adjustable brackets or fixings.**
- **No independent supporting structure, platform or chutes needed—just mount it over a flat belt, inclined or parallel to floor level.**
- **No noise, jolting or vibration.**
- **Saves cost of additional supporting steelwork.**

FE
FOR FOUNDRY EFFICIENCY
TRADE MARK

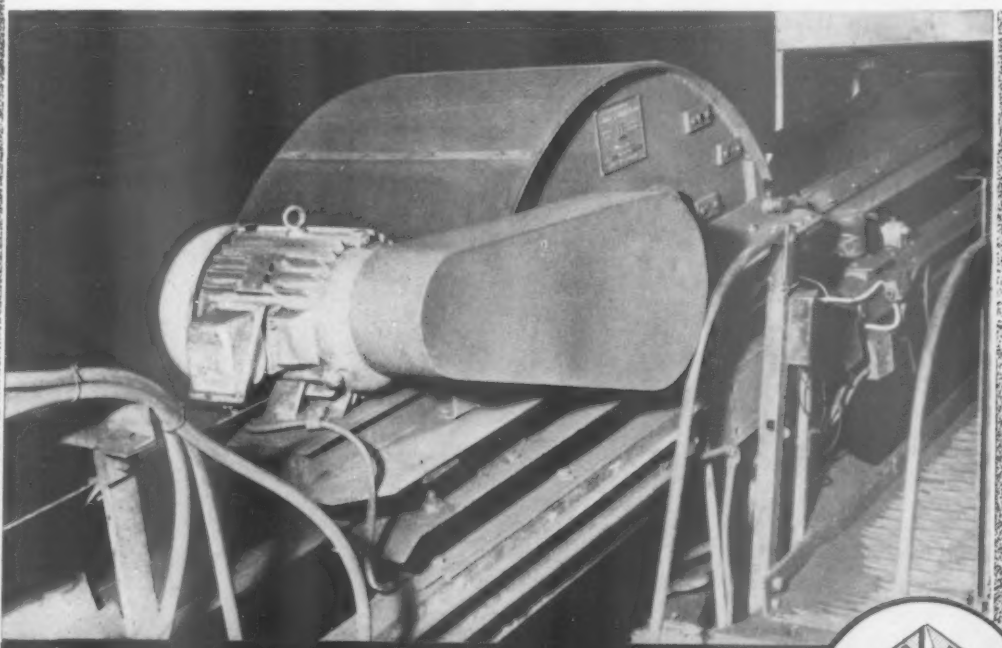
FOUNDRY EQUIPMENT
LIMITED
Leighton Buzzard, Bedfordshire, England
Telephone : Leighton Buzzard 2441 (5 lines) Telegrams : 'Equipment,' Leighton Buzzard, England

AERATOR...

The newest idea in Sand Aeration

- **Saves Elevator height and ideal for low headroom installations.**
- **C.B.M. is lower priced than other Aerators or Disintegrators.**
- **Can be installed in a few hours—cuts erection costs and does not interfere with production.**
- **Single low-powered electric motor drive—5 to 7½ h.p. is usually ample, even for high outputs.**
- **Vee rope drive and fully lubricated chain drive to twin paddles of special patented design.**
- **Machine is fully guarded.**
- **Quickly removable rubber cover for cleanliness, inspection and maintenance.**
- **Reduced maintenance—no pins to replace.**
- **Produces fully aerated "silky" sand for distribution to moulding lines.**

✱ *One of our clients already has four C.B.M. Aerators in their foundry plant—why don't you try one? All we want is a drawing of existing belt conveyor, decking and platform, and confirmed belt width and speed and maximum hourly sand output—we can give you a quick quotation and short dependable delivery.*



OVERSEAS COMPANIES:-

AUSTRALIA: Foundry Equipment (Australia) Pty. Ltd., Elizabeth, S. Australia.
CANADA & U.S.A.: F. E. (North America) Ltd., Toronto.
SOUTH AFRICA: F. E. (South Africa) (Pty) Ltd., Johannesburg.
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FE FOR FOUNDRY EFFICIENCY TRADE MARK

BLACKWELLS FOR ALLOYS

FAMOUS SINCE 1869

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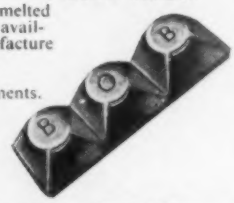

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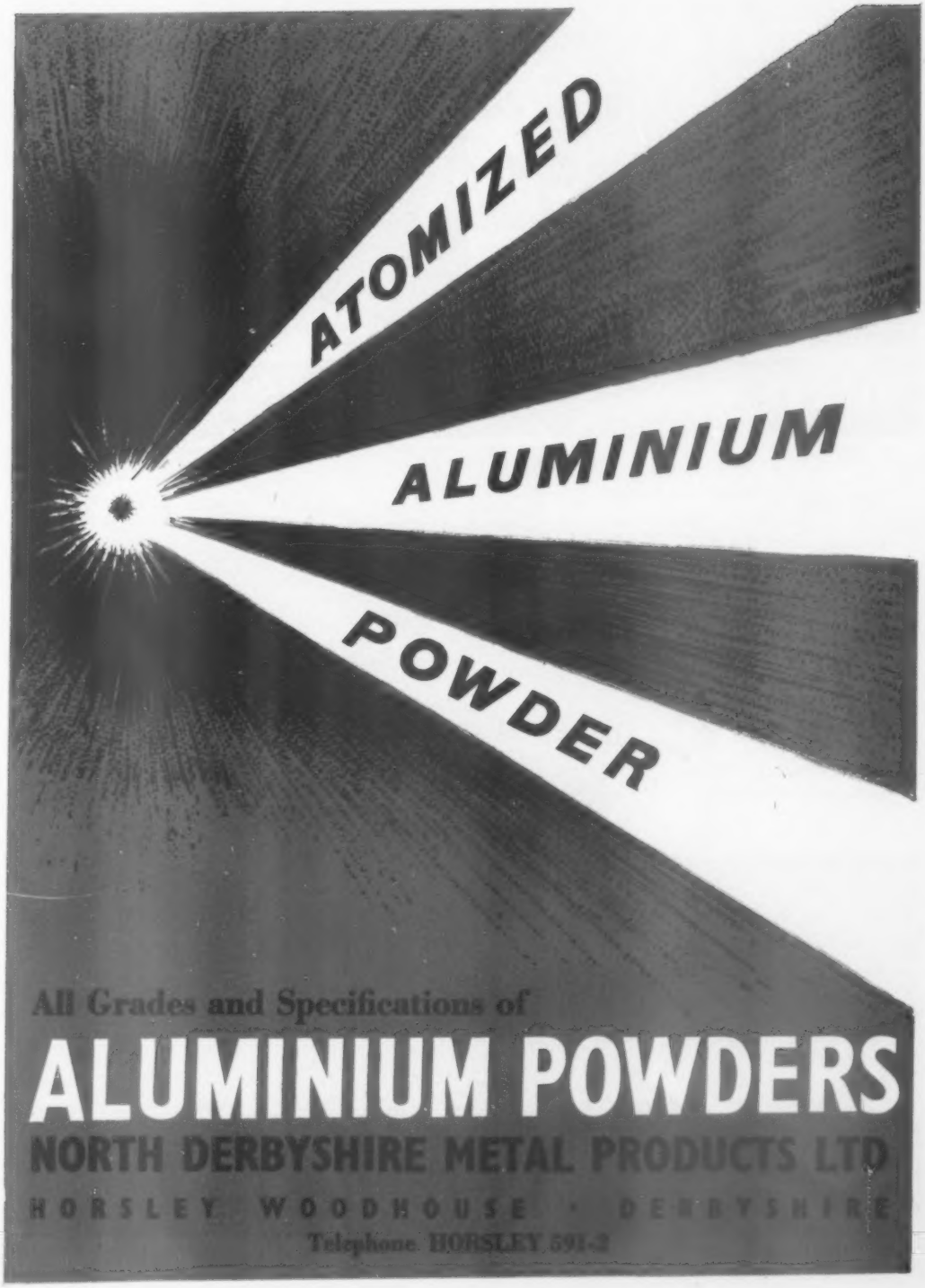
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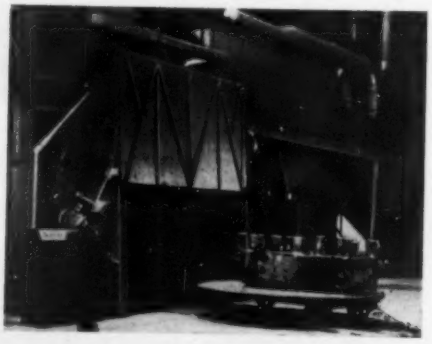

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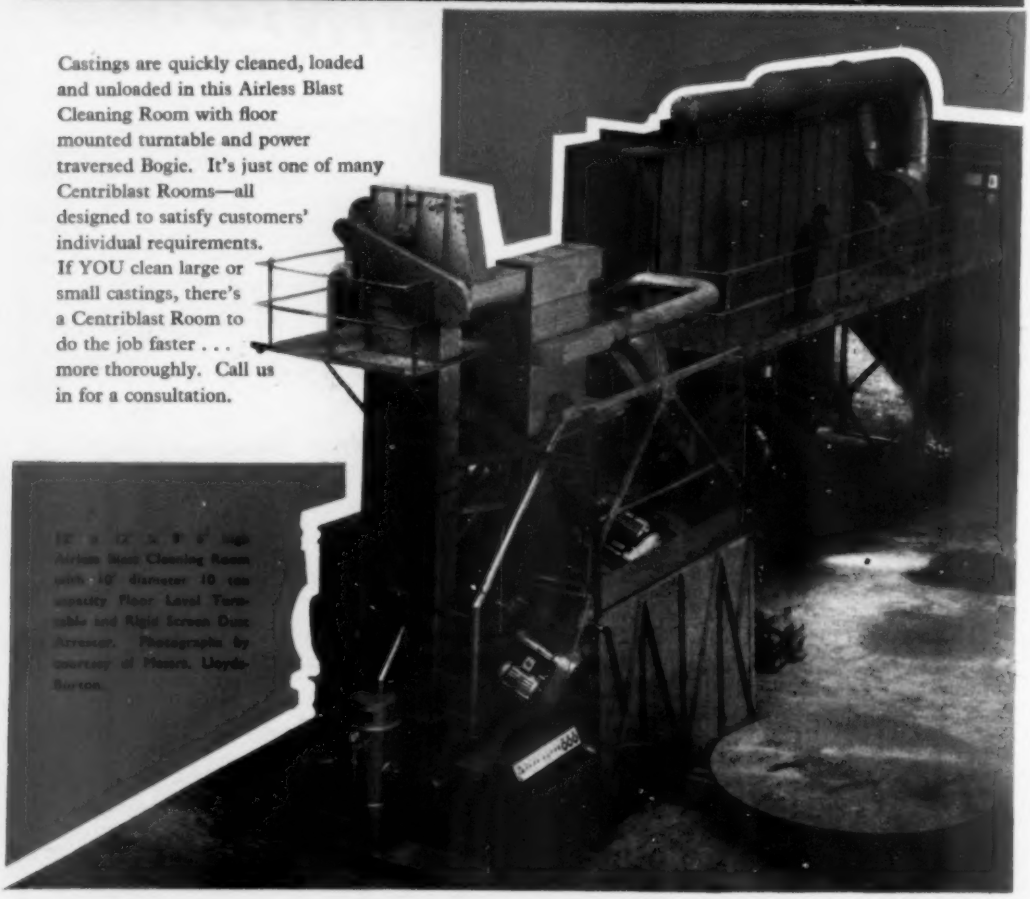

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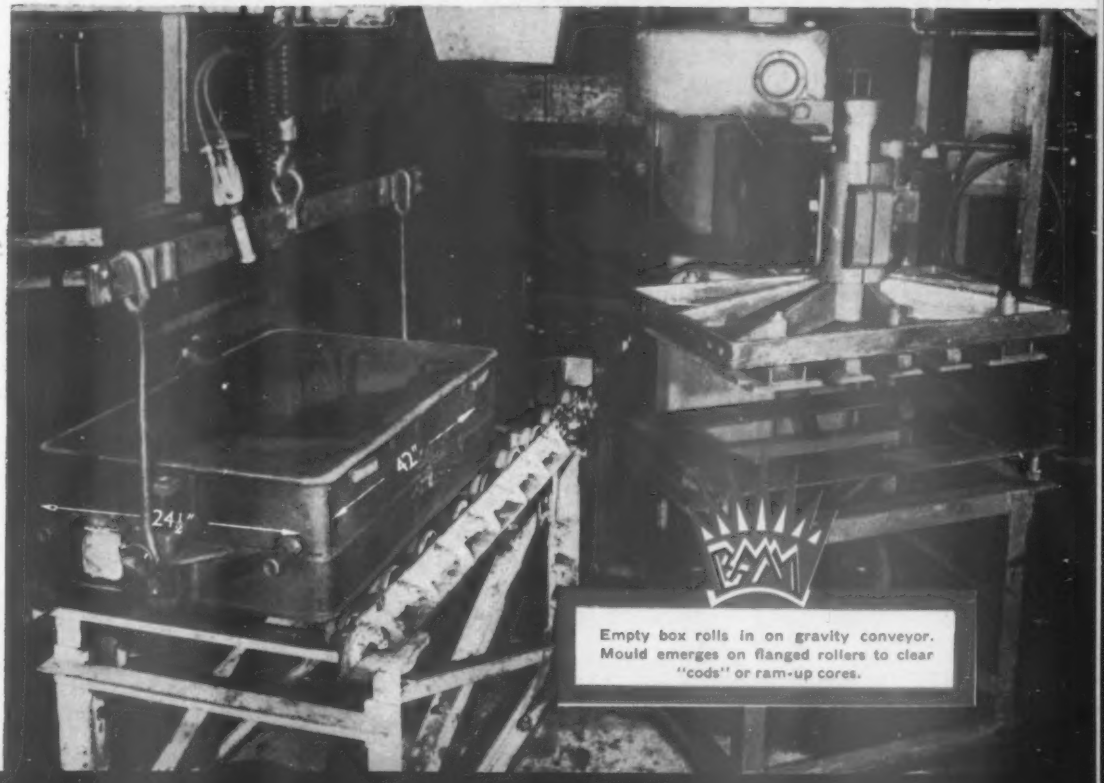

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The foundry industry of the United Kingdom is represented by the following organisations, many of whose proceedings are regularly reported in this JOURNAL:—

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Chairman: **M. J. Glenny.** *Director:* **Kenneth Marshall.** *Ass. Director:* **J. W. Butler.** *Secretary:* **D. L. Farrant,** 14, Pall Mall, London, S.W.1. 'Phone: WHitehall 7171. *Participating Associations:* British Cast Iron Research Association (affiliated); Institute of British Foundrymen (affiliated), and the following:—**Association of Automobile and Allied High-duty Ironfounders.** Secretaries, Heathcote and Coleman, 69, Harborne Road, Edgbaston, Birmingham, 15. 'Phone: Edgbaston 4141. 'Grams: "Clarify," Birmingham, 15. **British Ironfounders' Association and British Bath Manufacturers' Association.** Director and Secretary: J. Galbraith Sneddon, C.A., 145, St. Vincent Street, Glasgow, C.2. 'Phone: Central 2891. 'Grams: "Groundwork," Glasgow. **British Grit Association** (affiliated).—Secretary: J. Campbell MacGregor, 10, Bank Street, Airdrie, Lanarkshire. **British Malleable Tube Fittings Association.**—Secretary: F. B. Ridgwell, 196, Shaftesbury Avenue, London, W.C.2. 'Phone: TEMple Bar 6052-3. 'Grams: "Brimatufia," London. **Cast-Iron Chair Association.**—Secretaries: Peat, Marwick, Mitchell & Co., The Cast Iron Chair Association, Queen's Square, Middlesbrough, Yorkshire. **Cast Iron Heating Boiler and Radiator Manufacturers' Association.**—Secretary: J. R. Aldam, 69, Cannon Street, London, E.C.4. 'Phone: CITy 4444. **British Cast Iron Pressure Pipe Association.**—Secretary: W. I. Campbell, 14, Pall Mall, London, S.W.1. 'Phone: WHitehall 7941. **Cast Iron Segment Association.**—Secretary: W. Rose, Stanton Ironworks Company, Limited, P.O. Box 3, near Nottingham. **National Association of Malleable Ironfounders.**—Secretary: E. N. Turner, Chamber of Commerce Offices, Tudor House, Bridge Street, Walsall. 'Phone: Walsall 5671. **National and Midland Ironfounders' Association.**—Secretary: F. W. Sims, 69, Harborne Road, Edgbaston, Birmingham, 15. **National Ingot Mould Association.**—Secretaries: Peat, Marwick, Mitchell & Company, 301, Glossop Road, Sheffield. 'Phone and 'Grams: Broomhill 63031. **Roll Makers Association of Great Britain.**—Secretaries: Peat, Marwick, Mitchell & Company, Beaufort House, Newhall Street, Birmingham, 3. 'Phone: Central 6661-3.

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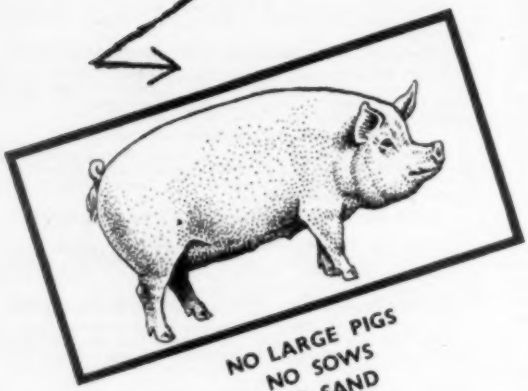

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PRINCIPAL CONTENTS

PAGE

Mass-production Shell-moulding

Description of plant, equipment, process and component development at British Engines, Limited, Newcastle-upon-Tyne 315

Planned Foundry Maintenance

By D. Ayres, A.M.I.C.E., A.M.I.Mech.E.

The case is argued for a rational approach to the problem of inspection and repair of foundry plant and equipment 323

IVE Anglo/Russian Exchange Visit

Final section of the report of impressions gained during the inspection of a number of Russian vitreous-enamelling plants and technological institutes 325

Production en grande série de moulages en carapace.
Description de l'installation, de l'équipement, des procédés employés et du développement des parties constitutives aux British Engines, Limited, à Newcastle-upon-Tyne. 315

Entretien prévisionné de la fonderie. Par D. Ayres, A.M.I.C.E., A.M.I.Mech.E.
Discussion pour une solution rationelle au probleme de l'inspection et de la réparation de l'installation et de l'équipement en fonderie. 323

Echange de visites anglo-russes sous le patronage de l'Institute of Vitreous Enamellers.
Impressions recueillies durant l'inspection d'un certain nombre d'installations russes pour l'émaillage vitreux, et d'instituts technologiques. 325

Maskenformguss in Massenherstellung.
Beschreibung der Anlagen und Einrichtungen, der angewandten Verfahren und der Entwicklung der Einzelteile bei der British Engines, Limited, in Newcastle-upon-Tyne. 315

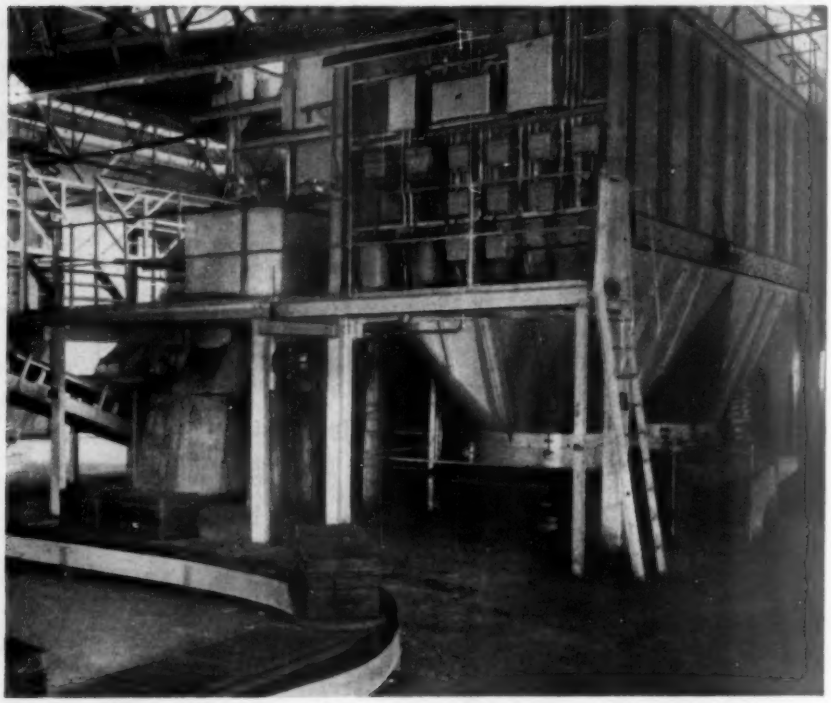
Planmässige Instandhaltung von Giessereien. Von D. Ayres, A.M.I.C.E., A.M.I.Mech.E.
Betrachtungen über eine zweckdienliche Anfassung von Problemen der Überwachung und Instandsetzung von Giessereianlagen und-einrichtungen. 323

Englisch-russischer Austauschbesuch veranstaltet vom Institute of Vitreous Enamellers.
Die während der Besichtigung einiger russischer Emaillieranlagen sowie einiger technologischer Forschungsinstitute gewonnenen Eindrücke. 325

Features, News, Commercial Information, and Statistics

Leader: Marketing Castings 313
Foundry Foremen's Training Course 314
Safety Teaching or Preaching 322
Guest, Keen's £1,500,000 Acquisition 322
NFCTC Courses in 1962 322
Non-destructive Testing Conference 322
BS for Compressed-air Fittings 322
Steam Chests for CEGB's West Thurrock Power-station 329
Personal 330
Equipment and Supplies 331
Notes from the Branches 333
Pig-iron and Steel Production 335
British Blast Furnaces in the June Quarter, 1961 336
Allied Reorganization 336
Design Appreciation 337
Day-release Education in Scotland 337
News in Brief 338
Company News 339
Raw Material Markets 340
Current Prices of Iron, Steel, and Non-ferrous Metals 342
Imports and Exports of Iron and Steel in July 344

MODERN FOUNDRY PLANNING



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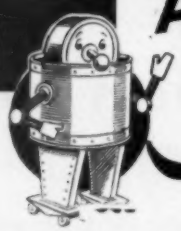

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FOUNDRY
TRADE JOURNAL
Vol. 111 September 14, 1961 No. 2336

Marketing Castings

Most of the foundry industry's employers' associations have formed committees to help their members with the problem of selling more castings. This is not an easy problem, as the markets for the various types have little enough in common. Foundries manufacturing domestic appliances have problems quite different from those making castings for the machine-tool trades; fundamentally, one is concerned with consumer goods and the other with capital goods. Again, some foundries have only a handful of customers, whilst others enjoy the confidence of hundreds. A good line of approach has been to produce a brochure or, in the case of the Americans, a large tome, emphasizing co-operation in the matter of design and detailing the properties to be expected from the various types of alloys made.

Some associations deem it more urgent to give assistance in the current and important problems of exporting to specific countries, and another activity which has had good results is the periodic publication of buyers' guides, restricted, of course, to their own members. Included in this category, *inter alia*, are the Federation of British Industries, the Association of Bronze and Brass Founders, and the Foundry Trades' Equipment and Supplies Association. This is but one activity designed to increase sales: there are many others, and it would appear that, in the immediate future, the main activity of employers' associations will be engaged in this field.

When appointing committees for the marketing of castings, the terms of reference should be very wide, as the position is constantly changing. At the moment, there is a possibility of Britain's entry into the Common Market, and at least one association—the British Iron and Steel Federation—has studied the ramifications of such a move and published a statement outlining the main implications. Consideration by the committees should also be given to what competition in the home market is likely to be encountered and how it is to be met. Here and there, firms may deem it wise, or, indeed, be forced, to change their traditional lines of business to meet new conditions. In this case, foundries will need much help from their trade associations and in their membership there are, or should be, an experienced nucleus of members well qualified and willing to help.

Foundry Foremen's Training Course

The next foundry foremen's training course, organized by the Institute of British Foundrymen, is to take place at the Grand Hotel, Scarborough, from Thursday, March 29, to Saturday, March 31, 1962.

Special Moulding and Core-making Processes

The first lecture on "Special Moulding and Core-making Processes" will be delivered by Mr. A. Tipper, M.SC., F.I.M., director and general manager of Harborough Construction Company, Limited. It will be divided into two parts (a) precision moulding methods and (b) core-making processes. The lecturer will describe under (a) a number of processes which have been developed for the production of castings with a greater degree of dimensional accuracy than can be obtained by conventional moulding methods. These will include investment processes, in such as the Shaw process; shell-moulding developments; CO_2/sodium-silicate process; plaster-moulding process; and high-pressure moulding and materials. Under (b) Mr. Tipper will describe and discuss the principle and applications of several core-making processes including air-setting oils; cold-setting binders; hot-box binders, their properties and applications.

Films

In the evening there will be a programme of technical films including "Hazard"; "Moulding on the Move"; "Terrapaint 55," and "Exothermic Padding."

Human Relationships

The session proposed for the morning of March 30 will commence with a lecture entitled "Human Relationships and the Foreman's Responsibilities to Management and Men" by Mr. R. Dunn, foundry manager at English Steel Corporation, Limited, Sheffield. The lecturer will consider the implication of human relationships on the basic responsibilities of the foreman, and the importance of good relations in the industrial organization with particular reference to the part played by the foreman. He will then discuss the foreman's use of functional specialists and the selection and induction of new labour and its training. Trade Union relations will next be considered, with emphasis on the shop steward/foreman relationship; the importance of job analysis; safety, and good housekeeping. Finally, Mr. Dunn will summarize the foreman's responsibilities and the contributions made by foremen's training courses and the foremen's associations.

Technical Assistance for the Foundry Foreman

The morning session will conclude with a lecture "Technical Assistance for the Foundry Foreman" by Mr. S. W. Palmer, F.R.I.C., F.I.M., superintendent of the member service department, British Cast Iron Research Association, Alvechurch, Birmingham. Mr. Palmer will discuss the responsibilities of the foreman, particularly with respect to his co-operation with foundry engineer and metallurgist. He will then consider how the engineer and metallurgist can give assistance to the foreman in his job of guiding the efficient production of good castings. To accomplish this the engineer should be alive to improved methods, new techniques, efficient materials handling, and elimination of dust and fume: the metallurgist should ensure correct quality in all foundry materials, including metal and sand. The lecturer will conclude by giving examples of various technical services to the foreman in the light of their availability to industry.

Castings from the Engineers' Point of View

The afternoon programme will consist of a lecture on "Castings from the Engineer's Point of View, with Special Reference to increasing the Service which the Foundryman can give the Engineer." (Arrangements uncompleted, details later.)

Training Facilities

The first lecture on the Saturday morning, "Training Facilities and Sources of Information available to Foundry Personnel," will be delivered by Mr. B. R. Pearson, lecturer in patternmaking and foundrywork at the Coventry Technical College. Mr. Pearson will begin by pointing out that in industry, opportunities for increasing one's knowledge and skill are often missed through ignorance of their availability. This may lead to frustration for the individual and loss of talent for the industry at large. Thus, the lecturer will survey the variety of sources of information which exist outside one's own works, and suggest ways and means of making the most of opportunities available. As Mr. Dunn will point out, the foreman in any industry should make sure he is in possession of necessary information relative to any project, so that he can encourage and advise the proper participation not only of the apprentices under his charge, but of adult workers also.

Mechanization, Utilization, and the One-off

The final lecture, "Mechanization, Utilization, and the One-off," will be given by Mr. A. Kirkham, B.SC., technical assistant to the managing director of David Brown Industries, Limited, Foundries Division, Penistone. He will deal with the rôle of the foreman in deciding the degree of adoption of mechanization in existing plant and his choice of mechanical aids; the reflection of various methods of production in the final costs of both quantity and one-off castings. This talk will be illustrated by slides showing how the foreman's own initiative on the use of existing plant and simple mechanical aids can result in increased productivity of the single casting.

Accommodation

Accommodation for 200 is available at the Grand Hotel, Scarborough, and the meeting facilities are first class. The course will be self-contained unless the number exceeds 200, in which case late applicants will be asked to stay at other hotels. The charge for accommodation at the Grand Hotel for the full period of the course, including luncheons on the Thursday and Saturday, is £6 14s. 6d.; where two participants are prepared to share a twin-bedded room this is reduced to £6 4s. 6d. Those not attending the whole period of the course will be charged from 36s. to 45s. for bed and breakfast, plus the cost of any additional meals. Ten per cent. will be added to bills to cover gratuities. Application forms for the course may be obtained from the secretary of the Institute of British Foundrymen, 14 Pall Mall, London, S.W.1, to whom they should be returned not later than February 28, 1962.

AUTUMN MEETING of the Institute of Welding is to be held at the Institute of Marine Engineers, Memorial Hall, 76, Mark Lane, London, E.C.3, from October 30 to November 3. Full details are available from the secretary of the Institute, 54, Princes Gate, Exhibition Road, London, S.W.7.

Mass-production Shell-moulding

Plant, Equipment, Process and Component Development at British Engines, Limited, Newcastle-upon-Tyne

At first thought, the word mass-production in this title might seem superfluous, for shell-moulding is almost invariably a quantity-production process. Nevertheless, at the Glasshouse Street works of British Engines, Limited, there has been built and equipped a "shell-only" foundry which, in aggregate, is capable of turning out no fewer than 250,000 castings per month of many types, but always with a built-in high degree of repetitive precision. Planning, process control and flow-production are of a very high order, as it is the purpose of this account to show. Last—but not least—the firm is producing castings from shells for components that were never cast before. Some items are made as castings that could not be made to the same degree of service efficiency by any other process, and still further castings replace components previously machined by "automatics" from bar stock. The whole output represents a substantial gain for the foundry industry in competition with alternative methods of production.

At British Engines, Limited, a private company employing a total of about 600 people, and situated at Glasshouse Street, St. Peters, Newcastle-upon-Tyne, it has long been traditional to use the firm's own foundry for producing components in a variety of non-ferrous alloys for the firm's machine-shop which specializes in the production of a very wide variety of precision-engineered parts and sub-assemblies. These include finished sub-assemblies for general-engineering purposes and particularly for mining equipment, liquid handling, heavy-duty electrical plugs and sockets required by main contractors to the oil, water, electricity, mining, ship-building and aircraft industries.

On the extension of a small existing shell-moulding non-ferrous unit at the works by Mr. C. A. Timms in the year 1954, a number of jobs were taken over as running lines for shell-moulding production. Amongst these were gunmetal and brass castings used in fairly-large annual quantities, machined on capstan lathes and for which tools for production machining were in existence.

Revised Layout

When the output grew, the existing premises became too small, and in 1959, a major reconstruction scheme was envisaged, resulting in the new "all-shell-moulding" foundry (Figs. 1 to 5), organized from start to finish on a flow-production basis. The firm's reconstruction scheme was triggered-off by a programme of rebuilding of the local dock facilities of the Port of Newcastle-upon-Tyne against which the works is situated. This work is expected to be finished in 1963.

The firm has now completed the reorganization of its shell foundry (which at present employs 60 out of a total foundry staff of 140) and a new patternshop and pattern stores. Following this, the

FIG. 1.—*Basic layout of the new "all-shell" foundry at British Engines, Limited, Newcastle-upon-Tyne.*

(1) Benches; (2) coreblowers; (3) curing ovens; (4) shell closers; (5) FLCB shell-moulding machine; (6) Polygram shell-moulding machines; (7) large shotblast plant; (8) cutting-off machine; (9) double-ended grinder; (10) dust-extraction unit, and (11) barrel-type shotblast plant (with its own dust extractor).

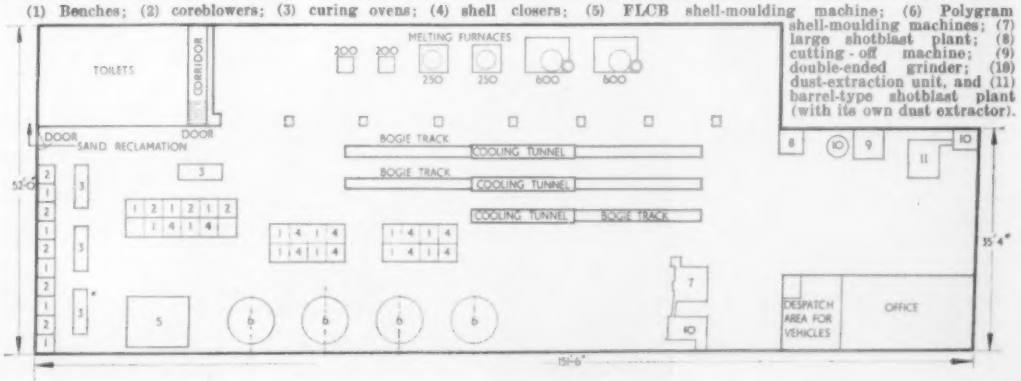


FIG. 2.—*General view of the shell foundry from the despatch end, showing (centre) the mould bogies and cooling tunnels; (left) the shell-moulding machines, and (right) melting furnaces.*

layout of the older foundry which produces non-ferrous castings up to 2 tons in weight is to be modernized and new plant and equipment installed there.

In the shell foundry (of floor area 120 by 52 ft. and 23 ft. to the eaves), there is a continuous flow of processing from shell core and mould production at one end and along one side, melting on the opposite side, to closing and pouring in the centre and knockout and fettling at the opposite end (see Figs. 1 to 3). The last-named includes cutting-off (mainly by abrasive wheel), followed by grinding-off runner-stubs and then the first shotblasting, carried out on a Tilghman Wheelabrator plant. Next, the castings are dressed, girl labour being used for these operations, and there is a final shotblasting, again in a second Tilghman (rubber-lined) plant, before castings are inspected prior to transfer for despatch either to outside customers or to the company's own machine-shops. Plant arrangement and capacity are such that each day's production of castings can be completely processed within the day, so that there is no accumulation of castings awaiting cutting-off, shotblasting or dressing. There is no room to store castings for anyone, so that cash turnover is immediate!

The shell-moulding section of British Engines is, in truth, a service unit for the whole of the engineering industry and, as stated, can produce ¼ million castings per month of non-ferrous components, weighing individually between ¼ oz. and 40 lb. Approximately 30 per cent. of the output passes to the company's own machine-shops.

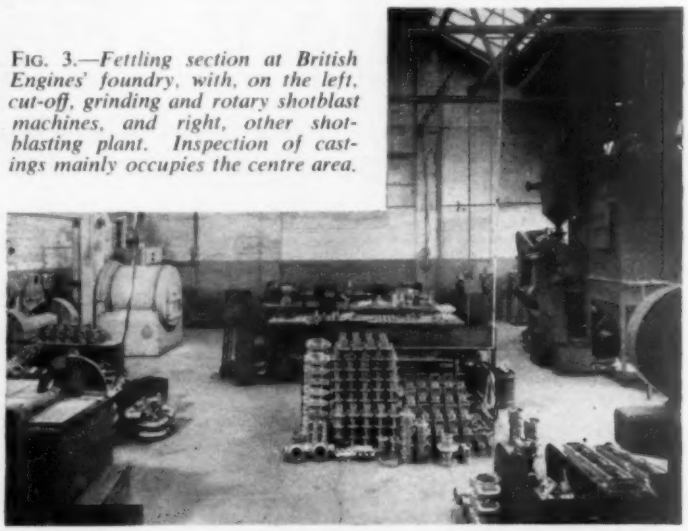


FIG. 3.—*Fettling section at British Engines' foundry, with, on the left, cut-off, grinding and rotary shotblast machines, and right, other shotblasting plant. Inspection of castings mainly occupies the centre area.*

FIG. 4.—*Battery of four Polygram Model IV shell-moulding machines.*

Plant and Equipment

Shells are produced from a battery of four Polygram mark IV units (Fig. 4) (taking patternplates size 16 by 12 in.) and one Fairbairn Lawson Combe Barbour machine producing shells from 24 by 16-in. patternplates and cores are made on eight Polygram Unit coreblowers. Other equipment includes seven furnaces for metal melting viz., three 800-lb. and two 250-lb. tilting crucibles and two 200-lb. lift-out crucibles, all oil-fired by Shell "Diesoleum." For shell closing, fourteen units are available. These were constructed by British Engines themselves and are operated from "pipe-line" vacuum.

As shown in Fig. 5, shells are poured in batches while carried on one of five trolleys (each holding up to 30 shells) which can immediately be passed under ventilated hoods for removal of casting fumes resulting from shell breakdown and resin incineration. The arrangement operated is to have one batch of poured moulds under a hood whilst a second batch is being poured, the mould bogies moving to and fro on the tracks provided (Fig. 5).

The list of foundry plant includes also cutting-off machines (model 55116, by Whitfields of Stroud); 20-in. Duplex grinders (model DHB20-621) by Luke & Spencer; three shotblast plants (models WA 1318, WA 378 and WA 1804) by Tilghman's; "Union" grinders (model 83539) by T. S. Harrison; Morrisflex linishers; Vortec sand mixers (by British Foundry Units); British Engines' own sand-reclamation unit, 4-ft. dia. and of 5 tons per day capacity; a Polford sand mixer, model 454; a number of hydraulic testing machines, a Wadkin bandsaw (model DR.7615), and Rowland abrasive cutting-off machines.

Services

Another notable feature of the plant is the provision of "piped" services to the various locations, for example, compressed-air to the shell-making machines, vacuum to the shell closers, numerous electricity points, piped release-agents, piped fuel-oil supplies, etc.

Pattern Production

At present, British Engines have upwards of 1,000 sets of shell-moulding patternplates (plus coreboxes) in fairly regular use. The firm's procedure in the making of patternplates—all of which are produced on the premises—is worthy of note. Following receipt of an enquiry for a cast

FIG. 5.—*Close-up view of two of the mould bogies and fume-extraction tunnels, showing also the arrangement of moulds for pouring. In the background are shown some of the melting units.*

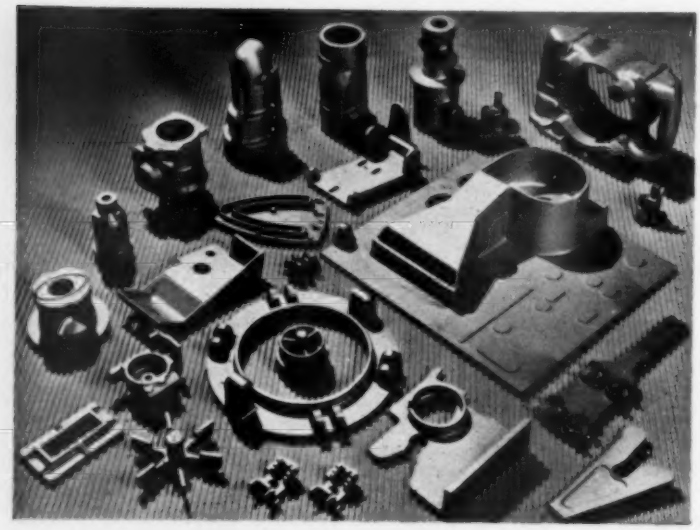


FIG. 6.—*Typical group of all shell-moulded castings produced at British Engines, Limited, illustrating a wide diversity of size and shape.*

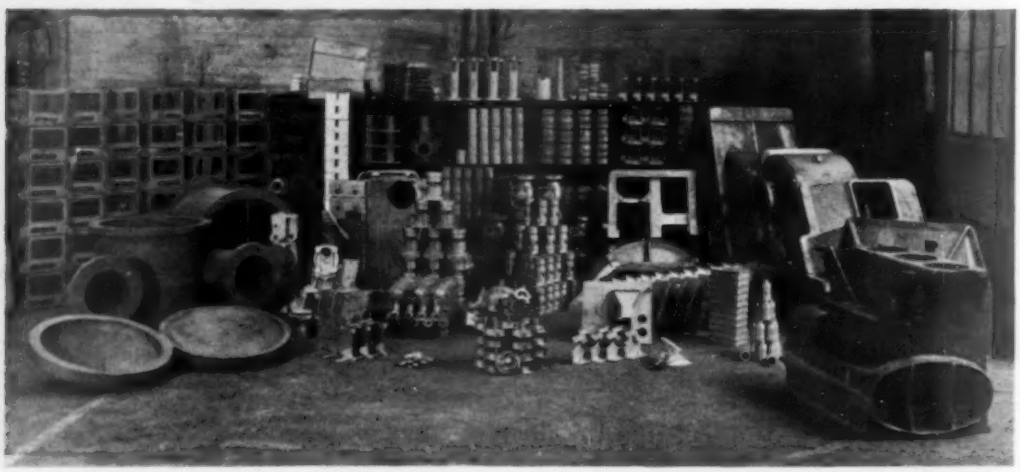
component, usually accompanied by a blueprint of the finished machined item, British Engines' planning staff prepare a re-drawing of the component as a casting, showing the actual dimensions of the casting which will be supplied and carrying stated dimensional tolerances which it is expected can be maintained throughout the run. (Castings can be—and are—shell moulded by the firm to an accuracy of ±0.005 in. per in., even across a joint-line, but in practice, if any machining at all has to be carried out, there is no need for working to such fine limits.)

What a customer does appreciate and value is that the re-drawing indicates jig location-points and the exact size of the cast component he will receive. Such information permits him to design immediately the necessary jigs, fixtures and other handling devices to suit the castings when they arrive at his machine-shop.

No pattern construction commences until the customer, in writing, signifies his approval of the casting drawing and accepts the quotation—which bears only part patternmaking charges. Thereafter, patternmaking is handled at British Engines just as any other precision component manufacture would be handled.

The casting drawing is applied to the build-up of a patternplate and the necessary coreboxes and separate engineering drawings are produced of each part of the pattern and corebox construction, including necessary contraction allowance and taper. The making of this plate is then handled by "ordering" from the company's machine-shop so many units, precision machined to these drawings, plus a cast-iron plate which is surface-ground

FIG. 7.—*Another group of castings produced at British Engines, Limited, including mainly shell-moulded items in the centre and ordinary sand-moulded castings of larger size (produced in the firm's ordinary sand foundry) at the sides.*



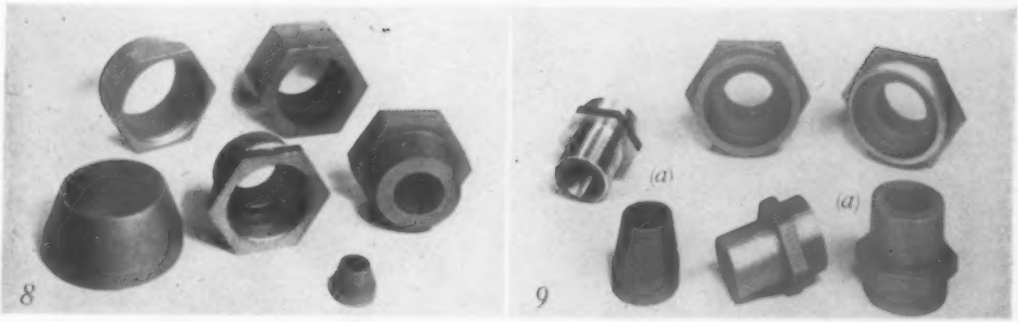


FIG. 8.—*Shell-moulded castings, all representing parts previously manufactured from extruded brass hexagon-bar and tube. The castings shown are in high-tensile brass BS.*1400 *HTB*1 *to give mechanical properties equivalent to the extruded tube. In the case of the two conical-shaped castings, these were previously machined all over from tube, but are now cast to the finished size, no machining being required.*

FIG. 9.—*Similar items to those shown in Fig.* 8, *but cast in aluminium alloy BS.*1490 *LM* 10 *W, these parts being previously made from extruded free-cutting aluminium-alloy bar and tube.*

all over and jig drilled as specified. "Pattern-making" back at the foundry, following receipt of these components from the company's machine-shop (and including sometimes the necessary runner and feeder-head components), is merely a matter of assembly—by relatively unskilled personnel. (In actual fact, only one skilled patternmaker is employed on this particular work.) Designing and laying out of runners, feeders, etc., is undertaken by the foundry management, who have built up considerable "know-how" as experience has been gained.

All commercial types of non-ferrous alloys (except magnesium) are melted and cast in this Newcastle foundry, including nickel-silver, Monel metal and zinc-base alloys. Examples from the production of shell-moulded castings are shown in Figs. 8 to 13, each group typifying worthwhile applications of the process, either in the field of product design, material or processing economies, variously indicated in the respective captions.

Component Design and Development

British Engines are rightly proud of the way shell-moulding has brought new business to the foundry industry, as stated briefly in the introductory paragraph of this article. This has been accomplished mainly in three ways, *viz.*:—

(1) In the orthodox supply of intricate castings against new designs; here the shell-mould process "wins out" because closer tolerances can be worked to repetitively, and blowholes and other defects such as sand inclusions (which together often account for about 50 per cent. of a sand-foundry's customer returns), are reduced to an infinitely-small percentage.

(2) Business has been secured in competition with the hot-brass pressings and forgings industries and also from the wrought-bar industries. For example, component (*a*) in Fig. 9 is a hollow screwed fitting in LM 10 W aluminium alloy which was previously machined from solid extruded aluminium hexagon-bar; over 100,000 of these have now been produced as shell-moulded castings.

(3) New business has accrued as the firm's ability to produce unusual shapes has become known—in some cases cutting out machining altogether. For example, the "teeth" in the bronze ring castings shown in Fig. 10 could not be produced so close together by any commercial process other than casting. If the teeth were machined from a solid ring, they had to be spaced sufficiently for undercutting by shaped milling cutters and this reduction in tooth number for a given diameter reduced the efficiency of the component in service. Nowadays, British Engines produce this item for the liquid-handling industry in totals of thousands per annum of the various diameters.

Yet another interesting job is the production of an aircraft component shown in Fig. 11, part (*b*). In this intricate casting, the customer demanded that the 12 ports should have exactly parallel sides and all dimensions should be ± 0.005 in., except the outside diameter. Produced in LM 8 (WP) aluminium alloy, this component was required in 50/100 lots. The shell-moulding process proved pre-eminently suitable for the job. Welding assembly would have been outrageously expensive for the number required and the job couldn't be die-cast because no taper on the ports could be permitted. In any case, the die-making cost would have been about £1,000 and occupy about six months, compared with a shell-pattern cost of about £200 and a two-months' period from enquiry to the delivery of castings.

Advantages

Since the start of the shell-moulding section, the

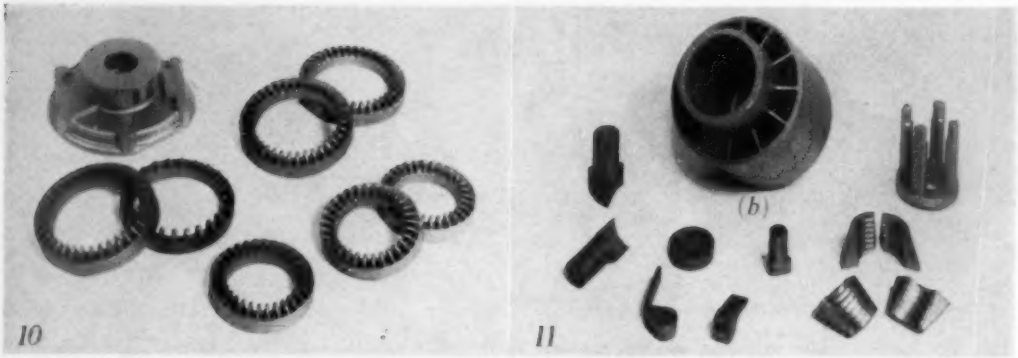


FIG. 10.—*The aluminium casting is a typical sample of castings made for the aircraft industry to BS.*1490 *LM8 WP. In the case of the group of gunmetal rings, a casting off the originally machined part is included to show what minimum spacing between the teeth was possible when this piece had to be machined from tube. The castings, all of which show a greater number of teeth, perform the same duty in service, but their efficiency increases with the number of teeth. It follows that the shell-moulded casting is not only cheaper than the original method, but is of greater suitability for the component application.*

FIG. 11.—*Various parts manufactured from shell-moulded castings where previously they were machined from solid. In all cases, considerable saving has been achieved, particularly in the case of the turbine casting, (b), shell-moulding being the only commercial process currently available which could give a casting in the alloy required, and also the dimensional limits of the parallel-sided ports on the port pitch circle, when the economics of small-quantity production is taken into account. This casting is held to* ±0.005 *in. on every dimension except the outside diameter and to a maximum collected error of* 0.015 *in. on the pitch circumference of the parallel-sided ports. The alloy used is BS.*1490 *LM8WP.*

adoption of castings produced in this manner (both in the home plant and amongst outside customers) has "snowballed." So rapidly is demand growing that it is expected to double capacity again over the next five years.

Typical examples of castings produced are shown in Figs. 6 to 13. Their main advantage appears to be not so much the greater as-cast precision *per se*, but uniformity of dimensions throughout large batches. This guaranteed narrow tolerance permits the feeding of castings into automatic machining set-ups, and is believed to herald a new age in castings adoption in machine-shops, of which examples will be quoted later.

Because of this greater uniformity, it is found economical to produce precision shell patterns where lots of as few as 200 to 500 castings only are required per year. An advantage is that once British Engines establish themselves with a customer and the pattern equipment (which never completely becomes a customer's property) is made and proved in service, practically all jobs become repetitive, though perhaps a year or more may elapse before a second batch is called for.

Summing up the lessons which are so graphically illustrated in British Engines' all-shell foundry, the process scores over rival "non-foundry" methods of manufacture and some other casting processes because of the following:—

(1) In view of trends in machine-shop practice towards automation and semi-automation, identity of component size, as conferred by shell moulding, is of major and ever-increasing importance to customers.

(2) From point (1) stems the value of the decision to manufacture patterns and castings only after prior approval of the customer of the *casting* drawings, agreement on jigging points, etc.

(3) While patternmaking proceeds, the customer can use the casting drawing as a basis from which to prepare his own jigs and fixtures with real confidence that they will be "spot-on" when the castings come along.

(4) Weight saving *per se* is of relatively less importance. For example, on a casting sold at 10s. each, ¼ lb. of extra metal at, say, 2s. per lb. costs the customer only 6d. per component, or £2 10s. 0d. per 100 castings. Yet, if because of blowholes or other unsoundness, he loses 5 per cent. of his machined production (a not unusual figure in some cases) and he has by then put in, say, £2 worth of machining (operator's time plus overheads) on each component, his very real loss is £10 in machining 100 castings. In addition, the customer in machining defectives may have broken or dulled an expensive tool and "fallen down" on a delivery promise—all representing losses against which he, the customer, has no redress whatever.

(5) It follows from point (4) that the real factor which founders should use in "selling" shell-

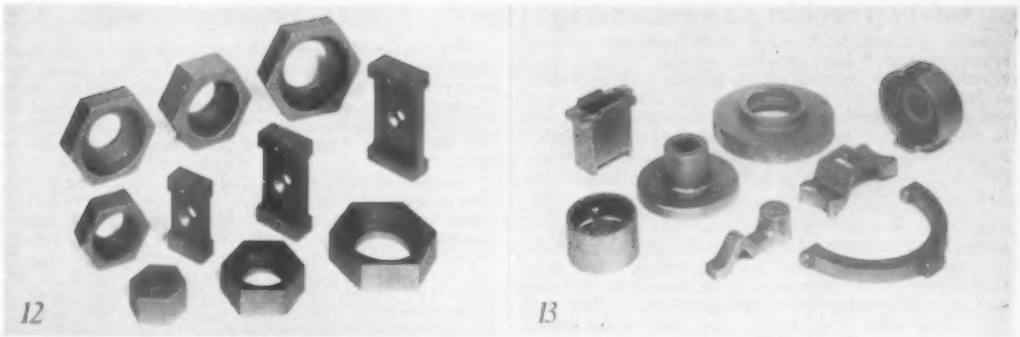


FIG. 12.—*Selection of shell-moulded castings in high-tensile bronze to BS.*1400 *HTB*1. *Every item shown was previously manufactured from extruded brass bar or tube and the nett result is an overall saving in the finished machined article of approximately* 20 *per cent.*

FIG. 13.—*Group of shell-moulded castings manufactured in brass BS.*1400 *B*3, *high-tensile bronze to BS.*1400 *HTB*1, *and gunmetal to BS.*1400 *LG*2. *In all these cases, the previous method of manufacture was to use brass pressings or stampings. A closer relationship of cast size to finished-part size results in considerable saving in machining in these instances and, consequently, means a cheaper overall finished product.*

moulded castings—or any other improved casting process for that matter—is reduction in scrap, and in this connection, British Engines report that scrap at the foundry and at customers' works has been brought to an infinitesimal proportion.

(6) Similarly, for the reason given in (5), the firm feel they can well afford to keep shell-mould pattern charges to customers at a very low level because—compared with ordinary sand moulding—the producer also benefits internally from having a very minimum of scrap during machining.

It should be understood that whilst specializing in shell-moulded castings production, it is realized that this process is only applicable to specific forms of casting requirements, and that diverse production of non-ferrous castings by sand-moulding methods obviously will always be required. In this direction the firm's sand foundry has received equal consideration in development programmes, especially in the production of complex castings in the more-difficult-to-cast alloys such as high-tensile brasses, aluminium-bronzes and Monel metal.

Acknowledgment

The directors and staff of British Engines, Limited, are to be congratulated on the enterprise, initiative and thoroughness with which they have established an all-shell foundry for turning out such a large mass of castings in a great diversity of size, shape and alloys. The writer thanks the firm for permission to publish this report on their plant and the operations carried out, to review basic product development, and for the loan of castings for photography and other illustrations. He also considers it incumbent on him to point out to other founders that much of the business success in shell-moulding now enjoyed by the Newcastle firm is not at the expense of the rest of the foundry industry. It results not from "piracy" but from excursions into hitherto uncharted seas, as it were, and evidently fickle fortune has again favoured the bold!

Shipbuilding Safety Conference

"Safety in the Shipbuilding and Ship-repairing Industries" will be the theme of a one-day conference being arranged by the Ministry of Labour in consultation with the Shipbuilding Employers' Federation and the Confederation of Shipbuilding and Engineering Unions, to take place at the Connaught Hall, Blackett Street, Newcastle-upon-Tyne, on October 16. The Minister, Mr. John Hare will be present. Subjects to be dealt with by the conference include a review of the special accident problems of the shipbuilding industry, introduced by HM Chief Inspector of Factories; a discussion on training in safe-working methods, and a review of safety activities in the industry and how further interest can be stimulated.

Sand-preparing Plant. In a 12-page catalogue, illustrated in colour, Richards Structural Steel Company, Limited, Phoenix Iron Works, Leicester, describe a range of mull mixers for the preparation of moulding sand. One page carries a table which gives—when working on a specified sand—the properties of the sand after one, two and three minutes' mulling time. These properties are permeability, compression strength and moisture when using four different capacity mills. The four models have capacity ranging from 56 to 35 tons per hr. The format of the catalogue is not such that it will fit easily into the folders normally used for trade literature. The company has also issued a three-language—English/French/Spanish—brochure telling of the general activities of the firm, with stress upon sand-preparing plant.

Safety Teaching or Preaching

Safety posters often come in for adverse criticism especially the "don't do this or that" type. Such criticism, in the opinion of the British Safety Council, is justified. "The best way to educate is to teach, not preach," says the Council's national director, Mr. L. D. Hodge. The Council believe that "teaching" posters can play a valuable part in industrial safety, and have recently launched a new "case-history" series along these lines.

The new posters—the first four of which are being distributed to over 7,000 factories and workplaces in Great Britain—illustrate the cause of common accidents, and suggest simple means for prevention. The series will cover very many aspects of safety in industry, and will be invaluable to safety officers dealing with new employees and apprentices, say the Council. "Negative, preaching posters, in the main, are a waste of time and money, but already we have proof that this new approach is having the desired effect, and the personal illustration rather than the negative command is getting through to the man on the job," concluded Mr. Hodge.

The first four posters deal respectively with accidents resulting from failure on the part of a trolley driver to obtain assistance in manhandling a heavy casting; a turner who used emery cloth without a holder; matchsticks being used instead of a proper electrical plug, and medical adhesive tape employed instead of the insulating variety for repairing an electric cable. In each case the preventive measure is stressed.

Contrasting with the generalization of the value of "teaching" as opposed to "preaching," is the statement made at a recent IBF meeting that "horrific" posters brought greater awareness of dangers. After exhibiting an enlarged picture of an accident, a foundry manager claimed his employees were much more amenable to persuasion in regard to the wearing of goggles, protective footwear and other safety aids. It would appear that, once again, "What's one man's meat is another's poison" is the dictum to apply.—EDITOR.

Guest, Keen's £1,500,000 Acquisition

The whole of the issued share capital of Thomas Crompton & Sons, Limited, manufacturers of hinges, locks, and builders' iron foundry, of Ashton-in-Makerfield (Lancs), is to be acquired by Guest, Keen & Nettlefolds, Limited, at an effective price of about £1,500,000. The acquisition will be effected by means of share exchange and the consideration will be the issue of £300,000 ordinary stock and £200,000 second preference stock of GKN.

The board of Thomas Crompton will be joined by Mr. R. Catlow and Mr. P. J. Tombleson, and Mr. Catlow will be appointed chairman. Mr. John Crompton, while remaining a director of the company, will retire as chairman and in recognition of his services will be appointed president. Mr. J. S. Crompton will continue as managing director.

Cold-blast Cupolas—Fine Imposed

A company operating cold-blast cupolas in Walsall was prosecuted recently for an offence under Section 5 of the Clean Air Act, which requires the use of "any practicable means there may be for minimizing the emission of dirt and dust" from any chimney serving a furnace or oven. According to the Press report of the case, the company admitted the offence, but it was pleaded that the existing cupolas were not strong enough to support the wet-arresters which the company had hoped to fit to the furnaces; and a scheme for an entirely new plant was being prepared to comply with the requirements of the Act. (A fine of £25 was imposed. The maximum penalty for an offence under Section 5 is £100).

NFCTC Courses in 1962

The National Foundry Craft Training Centre, West Bromwich, Staffs, reports that the next first course for apprentices from foundry firms (Term 138) has been oversubscribed and it has, therefore, been decided to accept 14 boys instead of the usual 12. The following dates have been agreed for courses to be held in 1962:—

Term 141, third course, January 1 to 25; term 142, first course, January 29 to February 22; term 143, open course, February 26 to March 9; term 144, second course, March 26 to April 19; term 145, first course, April 24 to May 18; term 146, fourth course, May 21 to June 15; term 147, third course, July 2 to 26; term 148, fourth course, August 13 to September 7; term 149, first course, September 17 to October 12; term 150, third course, October 22 to November 16, and term 151, second course, November 26 to December 21.

The open course (term 143), which will be devoted to a two-week appreciation course for engineering personnel, has been arranged following repeated requests for the Centre to provide a short appreciation course in foundry work for draughtsmen and engineering apprentices. The fee for the course is £15 including board residence at the Centre's residential club. Firms interested are asked to get in touch with the secretaries, Heathcote and Coleman, 69, Harborne Road, Edgbaston, Birmingham 15.

Non-destructive Testing Conference

The fourth International Conference on Non-destructive Testing, sponsored by the British National Committee for Non-destructive Testing, is to be held in London from September 9-13, 1963. In its preliminary notice, the Institution of Mechanical Engineers, who have agreed to arrange the Conference, list the following headings under which papers will be admitted, but point out that these are subject to review by the organizing committee:—(1) Basic physics and selection of method; (2) Non-destructive testing in general structures, *e.g.*, chemical plant, refineries, buildings, bridges, power-plants, etc. (3) Non-destructive testing in transport (ships, aircraft, etc.), and (4) future needs in non-destructive testing. Prospective authors are invited to write in the first instance, giving proposed titles of papers, to the secretary of the Institution, 1, Birdcage Walk, Westminster, London, S.W.1. The language of the Conference will be English, but it is hoped to publish summaries in French and German with each paper and to provide interpretation facilities. A programme of works visits, sightseeing tours and various social functions is also being planned.

BS. For Compressed-air Fittings

The use of compressed air grows each year as more and more applications are found for it. To help this growth, the British Standards Institution has revised and enlarged B.S. 1123, giving specifications for safety valves, gauges, and other safety fittings for air-receivers and compressed-air installations. Although the main provisions of the standard remain unchanged, modifications have been made to secure co-ordination with the 1955 edition of revised B.S. 759—"Valves, gauges, and other safety fittings for application to land boilers and piping installations for and in connection with land boilers." The most important of these modifications is the permissible use of safety valves having an established discharge greater than provided for by the minimum aggregate area formula. BS. 1123, costs 4s.

Planned Foundry Maintenance

By D. Ayres, A.M.I.C.E., A.M.I.Mech.E.

The Author here presents a detailed scheme for placing the maintenance of foundry plant and equipment on an orderly basis. It is difficult to gainsay the advantages of imposing order where chaos reigns and a proposed system that enables foundry management to gain control over a process that is otherwise left to chance is worthy of serious consideration. Its precise form, of course—as indeed its practical merit at all—must be decided in the light of actual conditions.

Is planned maintenance necessary? That is the question asked by many a foundry executive and although in the majority of cases the answer is in the affirmative, the degree of planning is subject to a considerable amount of analysis—the size, product and organization of foundries varying from the small jobbing firms to the highly-mechanized mass-production plant makes a text-book answer impossible. With the small jobbing foundry the executive will find that he knows practically every box pin by its christian name and hence will carry out repairs and maintenance with personal knowledge of the condition of the majority of his plant with very-little organized planning. In contrast the large mechanized foundry will be equipped with machines turning out up to 150 moulds per hour and subjected to rigorous foundry conditions throughout 24 hours a day. In such a plant it is usual for the maintenance to be completed by a maintenance section who carry out repairs for all departments of the firm and in such a case it is essential that good relationship and co-ordination exist between the maintenance engineer and foundry manager.

Planning

Planned maintenance may be defined as the organizing of repairs and maintenance of machinery to coincide with the period of deterioration and to this we may couple the function of preventive maintenance which aims to foresee or prevent a breakdown by regular inspection and attention. Many an executive has scrapped his organized system claiming that the amount of paper work involved defeated its object. However, paper work can be kept to a minimum by the use of a simple card system and a set maintenance-schedule based on the machinery manufacturer's recommendation for maintenance. The majority of the paper work will be in the initial setting up of the system after which a few entries in routine records will be all that is required. Before going into a "mock up" scheme it may be of interest here to note what advantages a planned maintenance system can offer, these appear to be as follows: firstly, reduction of involuntary stoppages due to breakdown; with a planned scheme it should be possible to foresee many faults and carry out their repair at any weekend long before the breakdown occurs; secondly, spares can be ordered well in advance since the conditions of wearing parts is known throughout their life, and thirdly we have the safety aspect to the operator, the compliance with the Factories Act and proof records of maintenance in the unfortunate case of defending a common-law action following an accident.

* Mr. Ayres is a planning and installations consultant.

Typical System

The procedure in setting-up a maintenance system for a foundry may be divided up into three parts: (1) Itemising, coding and indexing all major plant; (2) making out schedules for routine maintenance; (3) organizing and co-ordinating the system with the production staff and working periods. Under item (1) it is necessary to decide on the extent of recording and in the case of the foundry it is suggested that all major plant such as moulding machinery, Sandslingers, furnaces, ovens, mills, mixers and conveyors be given a code number which should be painted on the machine in a prominent position; a card is then made out for such machines which could be similar to that shown in Fig. 1. This card can be tagged-up on a date code with a coloured marker indicating when the next overhaul and type of overhaul is to be given, the card also forms a basis for recording points of interest on the machine, maker's address, telephone and spare-part numbers, type, size, working pressure, and voltage, etc., all which tend to get mislaid after the first three months following the installation of the machine.

Schedules

Apart from the card system the only other paper work necessary is in the form of a maintenance schedule and instruction sheet which is issued to

J F M A M J J A S O N D	J F M A M J J A S O N D
1961.	1962.
Title *Moulding M/C No. 22.*	
Type	
M/c No.	
Make	
Other details	
History	

FIG. 1.—*Illustration of a type of basic-record card for each unit requiring maintenance. It would be used as a signal to indicate when maintenance falls due.*

the maintenance engineer when work is to be carried out on the machine. This instruction schedule should be written in conjunction with the maker's recommendations for maintenance for their machine, and may follow the form of that shown in Fig. 2. If possible it is an advantage to cut down on the number of different schedules by including several instructions to the engineer who misses all those items not applicable to the particular machine.

Each schedule should be divided into say, four separate periods of maintenance and taking a very general case these should be: Types A to D inspection covering all work to be carried out weekly, six weekly, six monthly, and annually, respectively. The type A inspection should be put into operation without taking the machine out of service and it may be convenient to complete some of the work during a lunch-break or similar time. Items such as routine greasing, filter cleaning, tightening gasket bolts, could well be done and a note made of any special defect becoming apparent; the operatives

Part.	Satisfactory.	Defective.	Action.
(1) Grease all nipples			
(2) Check belt tension.. ..			Adjusted
(3) Check gear-box oil-level ..			
(4) Chain tension			
(5) Belt joints			
(6) Electrical connections ..			
(7) Earth resistance			Rewired
(8) Drive motor			
(9) Main roll-bearings ..			
(10) Safety guards			
Etc.			

REMARKS.
Spares Required next examination.
Signed.....

FIG. 2.—*Suggested form design for the short-period inspection schedule.*

should also be consulted for any complaints as to the reliability and behaviour of the machine. Type B inspection may require the machine to be taken out of service for probably an hour or two and would entail the more detailed checking of internal parts, cylinder heads, etc. Type C inspections could be of a major nature, and type D probably necessitating the complete stripping down of the machine and the replacement of parts reported as deteriorating during the previous inspections.

It should be appreciated that the above suggestions are of a general nature only and any scheme considered must be taken on its own merits. Having been issued with his schedule of instructions the engineer completes the current overhaul, enters in the remarks column his recommendations for spares required for the next overhaul complete with all sizes and details, signs the completed form and returns it to the records department. It is a simple task for a clerk to abstract any detail history, enter it on the record card (Fig. 1), re-tag to the next inspection date, and order any replacement materials. It is useful, though not essential, to retain the completed schedule on file, and only to enter the briefest history detail on the card system.

Electrical Plant

Apart from complete units such as furnaces, moulding machines etc., many electric motors, lighting and wiring will be found in the foundry all of which are subject to exceptional running conditions through dust, corrosive fumes and sand. For safety and prevention of fire-risks it is essential that these items be included on the Maintenance Routine Progress. They need not be entered on the card system as individual items but might, say, be classed as: (1) Electrical Service—Core Shop and, (2) Electrical Service—Foundry, depending, of course, on the size and type of the building. The maintenance electricians should check all building wiring annually, and power sockets and portable electrical equipment at least quarterly; their testing should include at least the insulation to earth, and continuity tests, and if at all possible, the use of a loop-impedance-tester would show a great saving in time on such examinations and give fool-proof results. Such testing instruments are expensive but in a large organization would repay their cost in the saving of the maintenance electricians' time over a very short period.

More detailed systems may be evolved incorporating columns for costing and recording maintenance engineers' times. These are of greater advantage to the larger organization where maintenance staffs and procedure require a machine to be written off when maintenance costs reach a pre-determined figure on economic grounds.

Australian Development

The standard-gauge railway is to be extended in Western Australia by 540 miles; to include a rail link from Kalgoorlie to Kwinana and a branch line to iron-ore deposits at Koolyanobbing for the steel industry to be established at Kwinana. The project will cost over £A40,000,000.

This is one of several projects announced or foreshadowed by the Federal and State Governments to speed development in Australia. They will cost just on £A44,000,000. Federal Treasurer Holt, foreshadowing the projects in his Budget speech in Parliament last month, said the Government believed it necessary to initiate in advance of actual need long-range projects to open up key resources for the use of industry and for exports some years hence.

In South Australia, over £A1,250,000 will be spent on improving rail facilities between the fast-growing industrial and steel centre of Port Pirie and Cockburn. At Cockburn, the railway connects with that serving the great mining centre of Broken Hill, on the New South Wales side of the border. Another £A2,000,000 will be spent on cattle roads in Western Australia, Queensland and the Northern Territory.

Mr. Holt, in his emphasis on planning for the future, indicated Government willingness to aid financing of projects helping development and exports. Apart from railways and roads, these include better facilities to help the rapidly expanding coal-exporting trade, more aid for oil search and more money for industrial and scientific research.

IVE Anglo/Russian Exchange Visit

Concluding publication of the second section of the report of the Institute of Vitreous Enamellers on the visit of their delegation to the Soviet Union last year, an account is given of the Novocherkassk Polytechnic Institute, the Artyom Factory at Lugansk, and the final meeting of the visitors with the State Scientific Technical Committee.

(Continued from page 287)

Novocherkassk Polytechnic Institute, near Rostov

Located in the centre of a mining district, the Polytechnic has seven faculties; mining, industrial chemistry, electrical and mechanical engineering, electric chemistry, building, mechanical mining and the geology of mining. It appears to be run on similar lines to the Leningrad Institute, as regards admission of students and arrangements for carrying out research work and is responsible for daughter institutes in other nearby towns. There are 5,000 full time and 600 evening students and 1,500 correspondence course students. There are 500 instructors, including 20 Doctors of Science, 170 graduate fellows and 300 assistant instructors. The industrial chemistry faculty has a leading chair in glass enamel and ceramics and a considerable amount of research in these subjects is carried out. There are approximately 25 students in each year of the enamel glass and ceramics courses, that is, 125 in all. The full-time course covers four years and ten months, evening studies course five years and six months, and the correspondence course six years. A full-time student spends 30-36 hours per week at the Institute.

Research Income

A considerable amount of theoretical and applied research is carried out for the State and for industry and the current research programme amounts to approximately £250,000 per year. Of this, some £107,000 is provided by the State, the remainder comes from industry. The Institute has close contact with universities with whom they co-operate on research projects and they have similar co-operation with the Academy of Science of the USSR. There are a number of post-graduate research students working at the Institute. The Institute's income from the State for instruction purposes would be worth about £1,680,000 in this country. When asked to explain the difference in the qualification afforded by the Institute as compared with a university degree, the director explained that the diploma of the Polytechnic entitled the student to be ranked as a qualified engineer, whereas the university degree qualified him as a research worker or teacher.

Apparatus

The party was conducted through the laboratories dealing with enamel research, by the professor in charge, Professor Azarov. The laboratories were particularly well equipped with apparatus, including the following:—(a) A fluidity-test apparatus which involved measuring the movement of a marker resting on an enamel sample during heating, so that information on melting and fluidity could be obtained from the marker position/temperature curves. Such curves are generally time dependent and although considerable discussion took place with Professor Azarov on this aspect, the influence of the time factor was not clarified. (b) Thermal balance which consisted of a fine spring balance positioned above a cylindrical furnace, the sample consisted of a piece of sheet metal about 2 by 1 in. The furnace was raised up to the sample and change in weight during the fusing process was observed by movement of the spring balance. Professor Azarov claimed that this apparatus allowed them to differentiate between good and bad groundcoats and to determine the behaviour of an enamel under any cycle of firing. This was considered an extremely dubious claim. (c) An apparatus for observing reactions between steel and enamel. The sample consisted of a taper strip of steel about 6-in. long and 1-in. wide at one end and ½-in. at the other. A series of holes about ¼-in. dia. were drilled along the length of the sample and the enamel to be tested was pressed into these holes. The strip was connected by clamps to the secondary of a transformer and heated with a current of 2 volts and 900 amps. Owing to the taper shape, temperature differential was obtained along the length of the strip and the reaction between the enamel and the steel in each of the small holes was examined miscroscopically. The use of this equipment is described in *Silikat Technik* April 1959, No. 4. (d) A Lilley Visconieter using a filament with a bead at each end—viscosity was calculated by observing the extension of the filament at various temperatures. (e) Apparatus was available whereby the appearance of enamel could be closely studied during heating. The specimen was positioned in a vertical tubular furnace fitted with two small diametrically-opposite side windows. A horizontal beam of light was passed through these and by a suitable lens system, an image of the sample was cast on to a screen. This equipment had been used for measuring enamel surface tension by means of the falling-drop technique. It had also been used for investigating the influence of steel on blister formation. (f) Adherence testing by means of falling-weight impact, together with a multi-probe head for determining proportions of bare metal. (g) Reflectometer apparatus. (h) Slump meter—similar to the "Ferro" apparatus. (i) Fineness testing—consisting of a glass cylinder of about one-litre capacity, the lower end being cone shaped and terminating in a leg about one centimeter diameter, calibrated in mls. A small amount of enamel slurry to be tested is diluted with water.

transferred to the apparatus which is then filled up to the mark, well agitated and placed in a vertical position. The amount of solid material settling in the leg in 30 seconds is a measure of fineness. (j) Warping machine—being an arrangement for enamelling a strip of steel held between clamps in a horizontal position and an arrangement of reading telescope to observe the deflection while the piece is in the furnace. (k) Crossbend-testing machine—the sample strip could be bent with the enamel either in compression or tension. The UK party criticized this machine as load application was by hand, whereas it is appreciated in England and America that it is essential to apply the load mechanically and evenly to obtain satisfactory results. (l) A vertical dilatometer for determining thermal expansion. (m) Vacuum-induction furnace. (n) An apparatus for the spectrometric analysis of gas drawn off a small sample during fusing. (o) An arrangement for making a cinefilm of the fusing process. The sample consisted of a strip of sheet metal about 1 by ½-in. heated by a transformer with an output of 2,500 amps. at 1½ volts. Magnification up to 3,000 was possible. (p) Differential-thermal-analysis apparatus. (q) Debye-Scherrer X-ray crystallographic apparatus, together with a microphotometer for assessment of the photographs obtained.

Direct Covercoat

Professor Azarov was questioned concerning work carried out on direct covercoat application. The staff had apparently done considerable work, but it had not been developed commercially. Much of their work was published in the East German publication *Silikat Tech.* He stated that they did not do any work on metal preparation for enamelling and he appeared to consider this outside their field. Much of the work carried out at these laboratories was first class. Apparently, research in enamelling is carried out on an individual basis, very often on a specific problem at the request of some industry.

Student Test-piece

During his stay at the Institute, each student must prepare a complete product and each of the delegation were presented with a white enamelled mug of ½-litre capacity and with a black illustration of the college buildings on the outside, apparently done by decal transfer. The enamel on these mugs was certainly better than any of the products seen on sale in any of the shops, the enamel being smoother, glossier and with greater freedom from boiling. This mug has been examined by one of the delegates with the following results. In general appearance the mug was very good. The finish was of high gloss and using a tristimulus filter, it gave a reflectance value of 78.5 per cent. Tests for acid resistance and thermal shock were carried out and the thickness of the enamel determined. The results of these examinations were as follow:

Acid Resistance

After treatment with (i) 2 per cent. sulphuric and (ii) 10 per cent. citric acid, the enamel lost its gloss and held a pencil mark after wet rubbing. It would be classified as Class B under the New BS.1344. It is understood that the usual acid resistance test for enamelled domestic appliances in Russia is boiling 4 per cent. acetic acid for 20 minutes and the loss in weight is determined. This was done with a resulting loss in weight of 0.8 mgm per sq. cm. The same test was carried out on a standard cooker enamel with a loss in weight of 0.1 mgm per sq. cm. This fits in with the results from spot tests and shows a lower acid resistance than standard British enamels.

Thermal Shock

The enamel withstood thermal shock well, crazing on the fourth heating up. Enamel thickness was found to be reasonable, with groundcoat (outside)—0.003 in., and inside—0.004 in., cover coat—0.006 in.

Further to these tests on the enamel, a total carbon was done on the steel—total-carbon content —0.14 per cent.

Artyom Factory, Lugansk

The Russian Artyom Factory plant situated in the town of Lugansk is old established and before the war produced mainly hollow-ware. It now produces cast-iron baths of various sorts and sizes, cast-iron sinks, sheet-metal solid-fuel water heaters, sinks, wash basins and hollow ware. They will shortly be embarking on a considerable rebuilding programme and will specialize on sanitary and technical products. The main production was cast-iron baths, of which about 600 were being turned out per day. The bath-enamelling plant consisted of 10 pairs of furnaces with 10 dusting machines. There was a very good arrangement of ventilated hood, which was lowered over the hot bath after it had been withdrawn from the furnace and put on the dusting stand. This hood completely enclosed the bath while it was being dusted, the only aperture in the hood being a comparatively small slot for the long handle of the dusting sieve. The shop was completely free from dust and the operators had no need to wear masks. A zircon enamel was used and the baths appeared to have a good finish.

Foundry

The bath foundry was well laid out with a fair degree of mechanical handling although not mechanized to anything like the extent of British Baths at Wembley, or of Bilston Foundries. Jolt/squeezing machines were used for moulding and a certain amount of hand ramming with a pneumatic tool. There were two cupolas, worked alternately, of approximately 5 to 6-ft. o.d. and probably of about 10 tons per hour capacity. The moulds were handled by electric hoists from overhead runways. There were two pourers operating together using hand shanks of about 1-cwt. capacity each and they were taking the iron direct from the cupola spout. Two ladles of iron filled the mould.

Enamelling Plant

The sheet-iron enamelling plant was equipped with one continuous and four box furnaces about 4 by 9 ft., all fired by natural gas. Dryers were conveyorized and consisted of monorail and lay-down types. One of the dryers was heated by waste heat from the continuous furnace. The groundcoat was all dipped and many of the covercoated parts, including the sheet-metal hand-basins, were first dipped in covercoat and finished off by spraying further covercoat wet on wet. The explanation of this was that drain lines were eliminated and production very considerably increased. The women dipping the covercoat appeared to be particularly skilful. The box furnaces were of the semi-muffle type. The staff had designed and built the furnaces, including the continuous furnace. The drop rods on the continuous furnace were single-piece, heat-resisting flat, about 1 by ¼-in. extending from the trolley for about 4 ft. and carrying any perrets. A bracket was welded on to the drop rod about 12 in. below the trolley to support the shoe plates. It was noticed that there was a slack chain between each pair of trolleys, apparently to control the amount of swinging of the drop rods. Perrets for firing were flat and for supporting hollow-ware consisted of flat strip of approximately 1 by ¼ in. with the top edge chamfered off, sitting loosely in slots cut in cross members. The steel used for enamelling was all cold rolled with a carbon content of approximately 0.06. Russians do not use nickel dip; the small baskets of ware, after swilling and neutralizing, are passed through a lay-down dryer for drying off.

Work Scheme

The incentive scheme in operation at this factory was based on a system which they called "norms." A norm was fixed for every job and any production above the norm received additional bonus pay. When a new job arose it was examined first by research and rate-fixing departments and a temporary norm was fixed. This temporary norm remained in operation until the operators had become skilled at the new job, when a permanent figure would be assessed. The operators have a right to appeal if they are not satisfied with the norm. The factory was working five 7-hr. shifts, plus five hours on Saturday.

Production

An interesting appliance being made at the Lugansk factory was a solid-fuel water heater. This was intended to stand in the bathroom, near the end of the bath and deliver hot water direct from its spout into the bath. It consisted of a cast-iron pot at the base for holding the coal or coke fire and standing on top of this the vitreous enamelled water heater about 5-ft. high and 12-in. dia., with a flue up the centre, about 4-in. dia. Presumably the flue pipe was fixed to the top to vent the smoke and products outside. The plant produces all its own frit and also supplies a little to other enamellers. The frit plant consists of four rotary smelters, each of about one ton capacity and natural-gas fired. Material handling is not much mechanized—mixers are used for mixing the batch. The frit is water quenched but the Russians had heard of "Ferro" roller quenching and appeared to be very interested in it. They are experimenting with a vibro grinder for grinding quartz and appear very confident that it will be very successful. The groundcoat appears to be of normal nickel-cobalt type and all the sheet-iron covercoat is titanium type. Mills for wet grinding and dry grinding are similar to those in use in this country, using porcelain balls and porcelain lining.

The assistant director stated that they used an instrument similar to an Elcometer for measuring thickness but his staff seemed tremendously interested in our meter and gave us the impression that they had not seen anything like it before. The assistant director informed the party that they had been doing development work on electrostatic spraying of vitreous enamel, using a slip prepared in the normal manner and we were shown a colliery-conveyor shoot on which electrostatic spraying had been used. He claimed that it would shortly be on a production basis. However, when this point was raised in Moscow at the final discussion it was stated that they could only spray flat pieces and could not cover the edges or interior surfaces of pressings.

State Scientific Technical Committee

Several enamelling technicians and research workers were also present at the final meeting with the committee. In the field of electrostatic spraying it was stated that they had developed the work of the American Wilkie but it was only applicable to flat sheets.

The Russians were anxious to know if anything had been done in England on electro-magnetic high-frequency firing and were told that only small laboratory samples had been used with this method. They claimed that they had a continuous process for enamelling the inside of pipes using this method. When asked if there was any wet-process cast iron enamelling being carried out in Russia the reply was that before the war a considerable amount of kitchenware used this process, but now only a small amount of hollow ware and such things as cisterns and traps were processed in this way. Their dry cast-iron enamel is all of the antimony type rather than zircon, because only 7 to 8 per cent. of antimony is needed, while one would require 16 to 20 per cent. of zircon and since these materials are of about equal cost the antimony enamel must be cheaper. Also the zircon-type enamel requires a much higher proportion of boron and it is necessary for them to economize in this material.

Steel Baths

Russians are very anxious to know the position in England regarding steel baths and appeared disappointed when they were told that the only company which had produced them had gone out

of production, mainly because their method involved welding together five pieces. They stated that Czechoslovakia and Hungary had plants making steel baths by welding five pieces and they were very expensive. The Russians intended very shortly to build a factory for producing one-piece steel baths which would have an output of a half million per year, it was stated.

They appeared to be very keen to obtain information concerning the acid-resisting enamelling or glass lining of chemical plant, especially pipes and were very disappointed that no information was available. A Professor Vargin said that the State standard for acid resistance consisted of 20 minutes attack with 4 per cent. acetic acid at boiling point, and the criterion was the loss in weight.

Conclusions

(1) In many ways the standard of enamelling in Russia is far inferior to that prevailing in Great Britain. This is particularly true in what might be termed "cosmetic" applications where enamel is not absolutely necessary for the actual functioning of the apparatus, but when good quality enamel is required to allow the equipment to function at all, *i.e.*, in chemical plant, the standards are very much higher. Up to now, most research and development has concentrated on this type of equipment but interest is now swinging to consumer goods finished with vitreous enamel. (2) Technical and scientific knowledge is quite well advanced although research is some years behind the latest investigations in this country. There may be some shortage of certain raw materials but these are being overcome and the way would seem open for rapid advances in both theoretical and practical application. (3) The Russian industry is now in the third year of a seven-year plan concentrated on the production of consumer goods, during which it is planned to increase the production of enamelled goods 40-fold.

Many new facilities are planned but it is possible that the Soviet Union could make good use of outside technical assistance on these plans and also import certain raw materials.

Ceramic Strainer-cores. Hepworth Refractories, Limited, Hazlehead, near Sheffield, have issued in loose-leaf form a catalogue listing—with line drawings—a dozen types of ceramic strainer-cores. A very useful service given on each sketch, is a figure showing the total area of the holes which are incorporated. On the reverse of the stiff, shiny cards making up this catalogue, data are given as to outside diameter, the thickness, number and size of the hole, and the equivalent gate diameter when used in foundry moulds; the dimensions being given in both inches and millimetres. These data take up about half the publication, the balance being devoted to details of runner sleeves, ceramic collars for use in investment-casting processes, furnaces throats for lining the spouts of small electric-melting units and ceramic bonnets for difficult core location. The whole makes an interesting publication carrying data otherwise not easily located.

BAC Take Over Magnesium Elektron

British Aluminium Company, Limited, announces that it has purchased the 40 per cent. shareholding of the Distillers Company, Limited, in Magnesium Elektron, Limited, which, with the 60 per cent. the company already owns, makes the magnesium firm a fully-owned subsidiary of British Aluminium Company, Limited. Magnesium Elektron, Limited, is the sole producer of magnesium metal, and has won international recognition for the successful development of high-performance magnesium alloys; its processes are licensed in many countries of the world, including the USA.

Rather more than half the metal at present supplied by Magnesium Elektron, Limited, is used for alloying with aluminium and for general industrial purposes. The remainder is used in the production of aircraft, guided weapons, military equipment and nuclear-energy plant for which consumption is expected to continue to expand. Demand should continue to grow for the manufacture of commercial vehicles and motor-cars, domestic and office equipment, electrical components, photographic equipment, etc.

Building Plans

Hitherto the metal has been produced by Magnesium Elektron, Limited, by electrolysis of the chloride salt, but the present high cost of electric power (nearly six times that of 1936) has made this process uneconomic. Plans are already in hand for the firm to erect a plant of 5,000 tons per annum capacity at Hopton, near Wirksworth in Derbyshire, to extract magnesium of 99.9 per cent. purity from the local dolomite by a thermal process, at present operated successfully by Dominion Magnesium, Limited, of Canada. Completion of the Hopton plant will make the UK largely independent of imports from overseas of this strategically important light metal. The dolomite deposits and the plant equipment and layout are such as to permit further expansion as required. The Hopton plant will employ about 180 men. There will be no direct effect on employment at the company's existing plant at Clifton Junction because pure metal produced at Hopton will replace metal at present imported and utilized at Clifton Junction.

Major C. J. P. Ball, D.S.O., M.C., who was responsible for the formation of Magnesium Elektron, Limited, in 1936, will continue as chairman of the company.

Wild-Barfield Changes

Wild-Barfield Electric Furnaces, Limited, from Otterspool Way, Watford By-Pass, Watford, Herts, announce that with a view to ensuring even more effective representation in England and Wales, some of the firm's area representation has been re-arranged. The areas affected—in which the representation of the furnace division of G.W.B. Furnaces, Limited, is also arranged—are: Birmingham and East Midlands; West Midlands; South Wales; Sheffield and North Midlands; and Northern England. Details of names and addresses of personnel and their spheres of activity are obtainable from the firm. The following appointments have been made in consequence of the re-organization. Mr. C. A. McNeill, joins the Birmingham and East Midlands area under Mr. G. W. Haines, area manager; Mr. T. M. Morgan, now takes over Wild-Barfield representation in South Wales and Monmouthshire in addition to that of G.W.B. Furnaces, Limited, and Mr. A. V. Skelsey takes over the newly-formed West Midlands territory.

Steam Chests

for CEGB's West Thurrock Power-station

Interesting Casting Operations by Armstrong Whitworth (Metal Industries).

Two sets of intercept steam chests (Fig. 1) for the West Thurrock 300-mw turbine generator installation have been ordered from Armstrong Whitworth (Metal Industries), Limited's steel casting division at Jarrow by AEI, Limited. The first of these left- and right-hand sets has just been completed and provides an interesting example of the production of a better-quality casting as a result of interchange of ideas between the foundry and the AEI design team.

The basic specification of the steam chests calls for molybdenum/vanadium high-temperature steels for operation at pressures of 700 lb. sq. in. at temperatures of 1,050 deg. F. (566 deg. C.) From the foundry point of view, three proposals—two of them of major importance—were made to facilitate casting and these were adopted in the final design. Elaboration of these points which follow serves to indicate to the foundry industry in general the value of such co-operation.

Directional Solidification

The original design of the branch ends contained thickened end-sections to allow for machining, so that a blanking plate could be mounted for pressure testing of the castings. This, however, produced the possibility of casting flaws due to centreline shrinkage caused by the irregular proportions; possible leakage around the studs on which the blanking-off plate was mounted and difficulties in subsequent welding were foreseen. To overcome these difficulties, the foundry proposals were accepted and the final design eliminated the thickened ends and included a tapered wall-thickness of from 2¼ in. to 1½ in., at the extremity to assist directional solidification. The casting was pressure tested without the need for studs, and after testing, was machined to the original drawing dimensions to allow welding to the next section of the turbine installation.

Support of Branch Cores

The possibility of disturbance in the flow of steel if conventional chaplets were used to support the cores, and the prospect of their incomplete fusion, led to a re-designing of the casting in order to incorporate a hole 6-in. dia. at the neck of the two branch pipes. This permitted the support of the loop-pipe branch-core by means of a bolted tie-bar—a method which not only avoided metallurgical difficulties, but which provided a more secure method of preventing core movement. The

FIG. 1.—*One of the intercept steam chests cast for AEI by Armstrong Whitworth (Metal Industries), Limited. The illustration shows the 6-in. hole incorporated in final designs by which it was possible to insert core supports for the two branch ends (left) and thus avoid the use of chaplets.*

Steam Chests

facing of this hole will be subsequently machined and a cover plate bolted on.

Mounting

The original intention of casting on integrally the brackets by which the chests are handled and mounted was discarded because of the danger of cracking and unsoundness which would have resulted at these locations. Instead, the castings now incorporate a simple pad on to which the mounting brackets will be bolted.

At the conclusion of the production and dressing operations the chests are subjected to gamma ray and grinding/crack-detection inspection.

Personal

Mr. J. S. McLauchlan has been appointed secretary of David Rowan & Company, Limited, marine engineers, Glasgow, one of the Lithgow group of companies.

Mr. G. D. Saul has been appointed chief inspector of the United Steel Companies' Steel Peech & Tozer branch. He succeeeds Mr. W. M. Gladwin, who has retired.

Mr. Walter d'Leny, joint managing director (technical) of the Billingham Division of Imperial Chemical Industries, Limited, has been appointed chairman of the division in succession to the late Mr. W. J. V. Ward.

Mr. Albert Speak has relinquished his post as chairman and managing director of the Coventry Machine Tool Works, Limited, and John Stirk & Sons, Limited, Halifax, but remains on the board of directors.

Mr. Henry Chisholm has been appointed chairman of ADA (Halifax), Limited, machine-tool manufacturers, West Mount Works, Halifax, in succession to Lieut-Colonel W. D. Gibbs, who has retired because of pressure of other commitments.

Guest of honour at the Joint Iron Council's banquet to be held at the Dorchester, Park Lane, London, on November 8, is to be His Excellency the Honourable George Drew, Q.C., High Commissioner for Canada. (Closing date for tickets October 9.)

Mr. A. C. Sturney has been elected to the board of the International Nickel Company (Mond), Limited, with effect from September 4. He is succeeded as general manager of publicity by Mr. L. F. Denaro, formerly assistant to the managing director.

Mr. R. Thornton-Jones, of the Brush Electrical Engineering Company, Limited, Loughborough, received distinction marks when he took the second-year examination of the Institution of Works Managers. Only one other student in the country received marks as high.

George Cohen 600 Group, Limited, announce the retirement of Mr. C. E. G. Nye, from the board of George Cohen, Sons & Company, Limited. Mr. Nye has been with Cohen's for 40 years, for many of which he has been closely associated with the publication of the "600" magazine.

Mr. Frederick Parry, head of the science and mathematics department of Grimsby College of Further Education for the past seven years, has been appointed principal of the Worsley Technical College, Walkden, Lancashire. He previously taught physics at the Dudley and Staffordshire Technical College.

Mr. Edward G. Smalley, chairman of Tweedales & Smalley, Limited, textile-machinery makers, Castleton (Lancs), has been appointed managing director in succession to Mr. H. W. Harper who has severed his connection with the company to devote himself to business interests in Birmingham and the South.

Davy & United Engineering Company, Limited, a member of the Davy-Ashmore group, announces the following appointments effective from September 1:—Mr. S. Baker, as general manager of the machinery division; Dr. R. B. Sims, as director in charge of engineering; Mr. Alan Thomas, as secretary, and Mr. G. L. Carswell, as assistant secretary.

Mr. M. Littlewood, B.Sc., has been appointed works manager of Metals & Alloys (Birmingham), Limited. He was formerly with Jones Sewing Machines, Limited, Stockport, where he held the post of general works manager. Mr. M. D. Love, previously sales office manager, S. Smith & Sons (England), Limited, Birmingham, has joined Metals & Alloys in a similar capacity.

Mr. A. Craig Macdonald, F.I.M., who for several years has been a director and production controller for Albion Motors, Limited, Glasgow, has been appointed general manager. This is stated to be because increasing responsibilities within the Leyland group prevent the managing director, Mr. Stanley Markland, spending all the time at Albion Motors which he considers necessary.

Sir Norman Kipping, director-general, and Mr. John Whitehorn, deputy director (overseas), of the Federation of British Industries are visiting Japan from October 4 to 21. During their stay they will have discussions arranged by the Keidanren—the equivalent in Japan of the FBI—and will visit a number of Japanese factories, and British industrial and commercial communities in Tokyo and Osaka.

Mr. J. G. Lorinson, has been appointed manager of Rocester Services, Limited, the service company for J. C. Bamford (Excavators), Limited, of Rocester, Staffs. He was formerly assistant area manager for Leverton's of Newcastle. Mr. H. Wilson, who has been appointed home sales manager for J. C. Bamrford (Excavators), Limited, has been with the company for nearly a year and was previously assistant sales manager.

Mr. Richard P. E. Tabb has been appointed deputy director of engineering of the English Electric Company, Limited. The directorate is responsible for the engineering policy for the whole range of the company's products (other than those of English Electric Aviation, Limited) and Mr. Tabb will be mainly concerned with the company's technical development programmes. He joined English Electric as a graduate apprentice in 1929.

Obituary

Mr. Charles Wilfred Butt, works manager of the Clay Cross branch of the Doncaster Wagon Company, Limited, has died at the age of 48.

Mr. Donald C. Urquhart, company secretary to the Ex-Cell-O Corporation, Limited, machine-tool makers, of Hastings Road, Leicester, has died at the age of 44.

Mr. John Campbell, chairman and managing director of the Central Foundry Company, Limited, Oldbury, died on August 23, aged 58 years. He had many contacts in the foundry industry and had been managing director of the firm for 25 years.

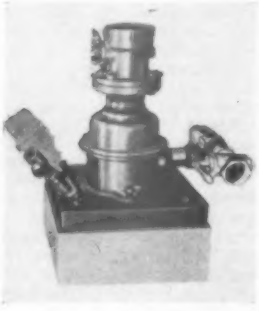
Equipment & Supplies

Concrete-floor Reinforcement

Causeway Reinforcement, Limited, Five Ash Works, Northfleet, Kent, announce that another application of Hexmetal (JOURNAL, July 6, 1961, page 22) is to prevent pitting and spalling of concrete floors when hot castings are placed on them. When such castings are placed on flooring containing their material, the makers claim that the honeycomb of metal absorbs heat and dissipates it evenly over the surface, thus avoiding cracking. The Hexmetal can be infilled with common concrete, granolithic or asphalt, and such floors may be laid in sections and can thus be placed around existing plant. The material is available in many forms, stock sheets measuring 10 by 3 ft., in a wide range of standard gauges and sizes.

Gas Burners

It is claimed that the new Eclipse "Star-Sixties" spiral-flame burner illustrated creates a flat, spiral flame which hugs the arch and/or walls of heat-treatment furnaces, etc., and that radiation effect, caused by the flame scrubbing large areas of the furnace wall, increases overall heat-transfer rates. Thus castings being treated can be located very close to the burner without danger of flame impingement or hot spots, it is stated, and as a result, new furnaces can be smaller and less expensive, with lower heat-loss from wall area than if conventional-type burners were used. Existing furnaces can be equipped with the new burners to handle larger loads.



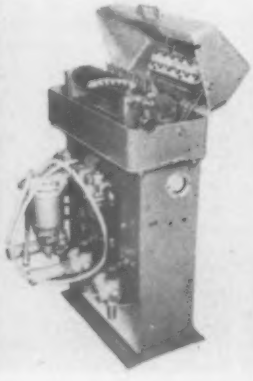
Six sizes of the burners provide capacities from 100,000 to 1,800,000 B.T.U. per hr. with flame diameters ranging from 13 to 60 in. Burners are factory-assembled, tested and shipped complete with a high-temperature combustion block. Details are available from Ad. Auriema Inc., 85, Broad Street, New York 4, N.Y., or Ad. Auriema-Europe, S.A., 172A, Rue Brogniez, Brussels 7, Belgium.

BMM and the Export Market

The necessity for British manufacturers of foundry plant when selling abroad to cater for the domestic requirements of the country of destination has been mentioned many times in this JOURNAL. What is seldom realized is the need to carry this dictum through to fine points of detail. For example, in shipping automatic control units for their moulding machines to central-European countries, the British Moulding Machine Company, Limited, have gone to the length of providing control panels worded in French or Serbo-Croat, as appropriate. In the accompanying illustrations, the top line of the panel in each case reads (from left to right): "Jolt," "Squeeze," "Jolt squeeze and vibrator stop" and "Pattern draw," whilst the lower line reads: "Start," "Arm in," "Arm out" and "Draw Exhaust." The third picture shows one of the control units to which the panels are fixed. Incidentally, during one month, this company exported no fewer than 43 moulding machines, the destinations being India (14), Belgium (12), France (5), Australia (3), USA (2), Mombasa (2), and one each to Jugoslavia, New Zealand, Finland, Bahrain and Holland.

Shelf Dividers

In the above photograph, taken at Aveling-Barford, Limited, of Grantham, a new Dexion product—the shelf divider clip—has helped solve the problem of sub-dividing storage racking, always present in foundry pattern storage. The section of shelving illustrated is on the upper level of a slotted-angle two-tier installation for small-parts storage. Standard 36 in. Dexion steel shelves are sub-divided into 6-, 9- and



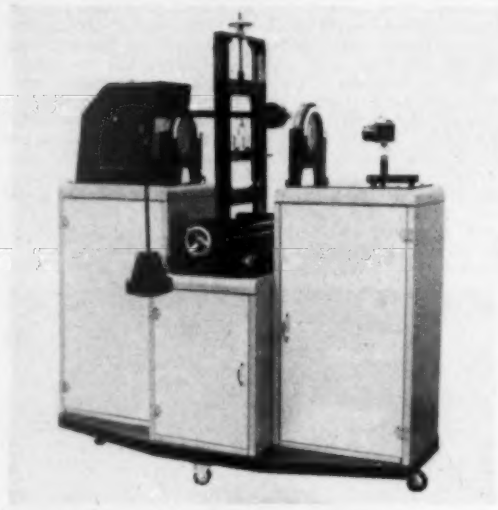


FIG. 1.—*Polariscope for photo-elastic stress analysis, developed by Sharples Engineering Company (Bamber Bridge), Limited.*

12-in. storage bins, to accommodate and classify a multiplicity of different parts. (Dexion Group, Maygrove Road, London, N.W.6.)

Exothermic Pads for Steel Castings

Foseco, Limited, Drayton Manor, Tamworth, Staffs, have recently introduced exothermic pads to aid the production of sound steel castings. It has been customary for a long time to thicken or "pad" sections of steel castings where in the absence of extra steel there would be an internal defect in another part of the casting. Such a system, however, though efficient, may increase the cost of production in the fettling shop as the removal of such added metal requires skilled labour, and even then the contour of the casting may be impaired. As an alternative, it is claimed that the exothermic pads do not impair the surface of the casting, and eliminate the labour to be associated with removal of extra metal. Moreover, the weight of the feeder-head can often be reduced when exothermic material is used resulting in overall economies, it is stated.

Polariscope

Sharples Engineering Company (Bamber Bridge), Limited, Chorley Road, Walton-le-Dale, Preston, Lancashire, have designed and placed on the market a 5¼-in. dia. polariscope applied to photo-elastic stress analysis (Fig. 1) in which provision has been made for using it either with diffused light or as a transmission instrument.

The diffused-light set-up incorporates a 60-w sodium-vapour lamp of the tube type for producing monochromatic light, and two 150-w tungsten-filament lamps for white-light illumination; the lamps are contained in a detachable lamphouse which also incorporates a diffusing screen. Polaroid discs of 5¼-in. dia. and quarter-wave plates, mounted between glass and carried in aluminium housing, can be rotated separately through 360 deg. as required. Loading is normally through a lever-and-dead-weight system, and tensile, compressive, flexural and torsional loads can conveniently be applied, it is stated. Provision is made for vertical and transverse movement of the loaded models and a swivel movement is also provided to adjust for space effect.

For conversion of the diffused-light polariscope into a transmission type, the existing lamphouse is replaced by a special platform which carries a 250-w compact mercury-vapour lamp, a 150-w tungsten-filament lamp and a 6-in. dia. condenser lens of optical quality. At the other end of the polariscope, a sliding bellows mounting is provided to carry the camera lens which then serves as a projection lens. A glass screen to accept tracing paper is fitted to receive the projected image.

Photographic Service

Industrial photography has special problems, which can only be overcome by the experience and special training of the operator—experience and training which local studio personnel, excellent in other ways, may not possess. On the other hand, to bring in a recognized industrial photographer from London or a provincial centre can be expensive, difficult perhaps to justify for routine jobs—progress records, machinery installations, etc. With this in mind, Brian Benson Art Services, Limited, 27, Broadway, Peterborough, have introduced a mobile service. A well-equipped photographic van, with a skilled industrial photographer in attendance, makes a series of tours, on a monthly basis, covering industrial areas in England, Wales, and South Scotland. "Tour Cards" are sent out to existing and potential customers one month before each weekly tour, and a list of appointments compiled for each week's journey. The tours are flexibly planned to meet the special requirements of customers as far as possible. The firm state that the response since the service was established about a year ago has been very gratifying, which seems to indicate that the demand for such facilities was hitherto unsatisfied.

Protective Switch: Electro Methods, Limited, Caxton Way, Stevenage, Herts, have developed a "Vibraswitch"—a vibration-sensitive device for protecting rotating and reciprocating machinery from extensive damage which may result from mechanical malfunction. When the vibration level of a machine protected with the device exceeds normal by a pre-selected amount, an internal switch closes, actuating either an audible warning system or a shutdown circuit before costly damage occurs. Failing bearings, broken mixer or impeller blades and similar malfunctions cause increased out of balance or high-frequency vibration detectable with the unit, it is claimed. The switch is available with or without electrical re-set and hold-on coils and can be supplied in water-tight or explosion-proof housings.

Traffic Control Barrier: A number of modifications have recently been made to a traffic control barrier manufactured by R. B. Pullin & Company, Limited, Phoenix Works, Brentford, Middlesex. The barrier, which is primarily for controlling vehicular and pedestrian traffic on factory roads, is made of a light tubular alloy and is available with an arm of any length of up to 16 ft. 4 in. It is raised or lowered by an electric motor and is supported in a substantial main frame. The arm of the barrier carries large circular signs bearing the word "stop." When several barriers are used in conjunction, they can be remotely controlled from a panel which provides automatic interlocking.

Notes from the Branches

Slough Section

The unusual course was taken on September 1 by the Slough section of the London branch of the Institute of British Foundrymen of holding a propaganda meeting. This was arranged in advance of the normal session's meetings and held in the premises of High Duty Alloys, Limited, who acted as hosts on the occasion. Invitations had been sent to the local Press and the country's technical Press, to managing directors and other senior personnel of foundries in the area, civic and industrial heads of Slough and the neighbourhood. Upwards of 50 attended. The proceedings commenced with a reception and buffet supper and bar set out in the staff dining-room of HDA and here a small, but comprehensive, exhibition of castings made in the area was on view. Throughout the proceedings, senior officers of the Slough section, the branch and the national Institute organization were present to answer queries and each member of Council of the section was assigned stewarding duties.

Following this reception, the whole party adjourned to the lecture theatre in the same building (where the session's meetings are normally held). Here, the section president, Mr. H. J. Proffitt, first introduced to the gathering the chairman for the evening, Mr. H. G. Herrington, C.B.E., managing director of HDA, a firm which has always accorded much support to IBF. Naming Mr. Herrington as patron of the section, Mr. Proffitt explained that this honorary appointment was a new departure for the section and was, he believed, without precedent in the Institute. It represented a means of according honour to one who had done so much in furthering the section's affairs and would serve also to confer status on the section and attract further support from the local industry.

Next, Mr. Herrington in a short introductory speech expressed his pleasure in the new appointment and referred to his continued interest in the art and mystery of founding, which had started at a very early age. He related an anecdote of how the late King George VI when visiting the HDA foundry had confounded all present with his intimate knowledge of foundry operations." "There was nothing extraordinary about it," His Majesty had explained in response to queries, "I underwent several months' training in foundrywork as part of the curriculum at Dartmouth College." This, Mr. Herrington said, was typical of the never failing interest provided by foundrywork.

The proceedings were continued with a talk by Dr. A. B. Everest, IBF past-president (who represented the national president, Mr. D. A. Richards at the gathering), on the aims and objectives of the Institute and the *modus operandi* of its functioning in a number of spheres—educational, practical, research and over-

At the Slough section propaganda meeting, (from left to right) the local president, Mr. H. J. Proffitt, Mr. A. R. Parkes, London branch president, and Mr. G. Lambert, IBF secretary, are chatting with His Worship the Mayor of Slough, Alderman N. Eshle.

(Left) Part of the reception committee at the Slough meeting, (l. to r.) Mr. G. Lambert, Mr. H. J. Proffitt, Dr. A. B. Everest (IBF past-president, representing the national president, Mr. D. A. Richards), the Mayor of Slough, and Mr. H. G. Herrington, C.B.E. (managing director of High Duty Alloys, Limited) who, as honorary patron of the section, took the chair. (Right) Some of the castings displayed at the same meeting. Made up of examples from the production of local founders, they included iron, copper-base, light-alloy, steel and investment castings. Prominent in the foreground is the Telegas apparatus for determining the gas content of light alloys.

Notes from the Branches

seas. He put into a nutshell the very qualities which have built up the IBF into such a world-renowned body of technologists as it is to-day.

Film Shows

Following this exposition, the London branch president, Mr. A. R. Parkes, was called upon to present a 15-min. excerpt from the Institute's film "Flow of Metal into Moulds," this being by way of giving an example of the sort of work conducted by the IBF Technical Council which makes available to members the results of co-operative research carried out by sub-committees.

Further elaborating this presentation of the type of programmes offered to members, Mr. H. J. Proffitt followed by introducing a further short film "Your Eyes are Precious," made available by courtesy of the British Steel Founders' Association.

Prefacing the showing of this second film, Mr. Proffitt said that probably the most important function of the Institute, at section level, was to promote the intellectual welfare of its members by periodical meetings for reading and discussing papers on subjects connected with the foundry and its allied industries, and he explained to the audience that the section's technical meetings were held on the basis of about one per month during the September-April session. In preparation for the coming session (first meeting September 19), the section's Council had conducted a ballot in which the interests of members in various foundry topics were assessed and this, he said, had resulted in a well-balanced programme, a copy of which had been handed to each person present. Bearing in mind the wide diversity of foundry activities within the area of the Slough section (bounded by Aylesbury to the north, Oxford and Reading to the west, and Farnborough and Hayes to the south and east), the programme had been arranged so that there would be something of interest to all.

The objective of the evening's meeting, he continued, was to publicize the section's activities as widely as possible in the hope that the present audience would do what they could to interest personnel in their own organizations or their friends and colleagues, who he felt sure would gain by joining the Institute. Mr. Proffitt then briefly reviewed the session programme lecture by lecture before introducing the film, which he said was typical of what would be included at the section's own film evening. "Your Eyes are Precious," he said, was intended for the education of foundry personnel into the dangers which exist to one's eyes, the effects produced, preventive measures available and, to some extent, the legal aspects at present operative in certain types of foundry. The film was an example of many such films available for showing, on a wide range of subjects.

(So that members of the Press in particular could properly report the evening's activities, each member attending was supplied with a copy of the Institute's booklet "The IBF and its Objectives," an issue of *The British Foundryman* and excerpts from the evening's speeches and information about the speakers. Membership forms and other literature were also made freely available.)

Discussion

Following the film showings, the meeting was opened for discussion and questions were invited on the general organization of the section and detailed aspects of the session's programme. A considerable number of comments were forthcoming, mainly of a constructive nature, such as the request for more papers on management topics. One speaker asked how safety practices could be inculcated, saying that he had found the "horrific" type of poster was very useful for impressing personnel with the need to wear protective clothing. Other speakers expressed surprise that the activities of the section and the Institute in general were on such a broad scale. The secretary of the Institute, Mr. G. Lambert, replied in part to the request for papers on managerial topics by saying that the difficulty was always experienced in getting sufficient practical papers, but that the IBF Foremen's Conference held annually was an occasion when foundry organization and kindred topics of interest to executives were put forward and discussed.

At the conclusion of the proceedings, several members of the audience expressed their intention of bringing along new or prospective members to future meetings of the section and congratulated the organizers on their enterprise, by starting the session on such a progressive footing. This sentiment was echoed from the chair and the meeting closed with the expression of thanks to all the individuals who had given time and effort to make the evening a success. Particulary, thanks for the lavish hospitality were accorded to High Duty Alloys, Limited, and to Mr. Herrington for giving his personal help with the project. The organization of the meeting was in the hands of a sub-committee of the Slough section Council, and much credit is due to the local secretary, Mr. R. J. Bown.

New Edition of BS. 1400

The new edition, published in August, of the British Standards Institution's "Schedule of copper-alloy ingots and copper and copper-alloy castings" (B.S. 1400), in approximately 100 pages brings together general, chemical and mechanical requirements for high-conductivity copper castings and for castings and ingots in 33 copper alloys.

Among the many changes in the new publication, a useful addition is the inclusion of a colour code for each of the ingots specified. Thus, SCB6—1 . . . Colour code—green/brown. It was not possible, however, to extend this scheme to include castings.

High-conductivity coppers HCC1 and HCC2 and new alloys PB4, LB4, LB5, G3, SCB4, SCB5, CMA1, CMA2, and DCB3 have now been included. Three of these arise from an extension of the range of brasses previously designated "B," and its sub-division into sand-cast brasses (designated "SCB") and die-cast brasses (designated "DCB"). For convenience, the earlier superseded code numbers are included in the summary table. One alloy, SB1, has been omitted.

A number of amendments have been made to the chemical compositions of the alloys, including differentiation between the limits specified for ingots and castings for certain of the elements. Mechanical properties have also been reviewed and a number of amendments made.

For the phosphor-bronzes, leaded-bronzes and gunmetals, properties for continuously cast material have been included. The general format of the schedule, and the wording of general and specific clauses have been brought into line as far as possible with the recommendations of PD 2436: Memorandum on the preparation of British Standards for non-ferrous metals. For the gunmetals and leaded gunmetals recent research on the effect of impurities has been taken into account in fixing limits only for those elements known to be harmful and likely to be present, and a total figure has not been included. Copies of this standard may be obtained from the BSI sales branch, 2, Park Street, W.1; price 21s. post free.

Pig-iron and Steel Production

Statistical Summary of June, 1961 Returns

The following particulars of pig-iron and steel produced in Great Britain are from statistics issued by the British Iron and Steel Federation. Table 1 summarizes activities during recent months. Table 2 gives production of steel ingots and castings in June. Table 3, weekly average production of finished steel in May. Table 4 gives the production of pig-iron and ferro-alloys in June, and furnaces in blast. (All figures are weekly averages in thousands of tons).

TABLE 1.—*Iron and Steel Index and General Summary of Pig-iron and Steel Production.*

Period.	B.o.T. Price Index, 1938 = 100.			Iron-ore output.	Imported ore used.	Coke sent to blast furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Steel (incl. alloy).			
	Iron and steel.	Coal.[1]	Basic materials[2]						Imports.[3]	Prod. ingots, castings.	Delivrs. finished steel.	Stocks.[4]
1959	340	496	477	286	244	210	242	208	7	388	291	2,244
1960	339	505	482	329	319	264	303	243	24	467	361	2,702
1961—Mar.[5] ..	339	538	480	351	322	264	313	248	11	471	358	2,779
April ..	339	538	482	313	322	261	308	244	6	472	355	2,745
May[5] ..	339	520	484	333	304	254	300	244	5	466	343	2,754
June ..	340	520	480	326	298	249	297	233	5	447	347	2,695

TABLE 2.—*Average Weekly Production of Steel Ingots and Castings in June.*

District.	Open-hearth.		Bessemer and LD.	Electric.	All other.	Total.		Total ingots and castings.
	Acid.	Basic.				Ingots.	Castings.	
Derbys, Leics, Notts, Northants, and Essex ..	—	3.7	14.8 (basic)	2.5	0.1	19.7	1.4	21.1
Lancs (excl. N.-W. Coast), Denbighs, Flints, and Ches	1.3	33.9	—	5.2	0.4	39.4	1.4	39.4
Yorkshire (excl. N.-E. Coast and Sheffield) ..								1.4
Lincolnshire	—	51.3	—	—	0.1	51.3	0.1	51.4
North-East Coast	0.9	85.8	—	1.7	0.4	86.6	2.2	88.8
Scotland	1.3	40.7	—	4.1	—	43.8	2.3	46.1
Staffs, Shrops, Worcs, and Warwicks ..	—	24.6	—	4.6	0.7	28.0	1.9	29.9
South Wales and Monmouthshire	1.4	80.4	19.4 (basic)	0.6	0.1	101.4	0.5	101.9
Sheffield (incl. small tonnage in Manchester) ..	9.2	36.7	—	15.0	0.5	59.1	2.1	61.2
North-West Coast	0.1	—	5.2 (acid)	1.0	—	6.1	0.2	6.3
Total	14.2	357.1	39.4	34.7	2.1	435.4	12.1	447.5
May, 1961[5]	12.4	379.2	38.2	34.3	2.0	454.6	11.5	466.1
June, 1960[5]	13.2	381.3	36.5	33.2	2.2	455.1	11.3	466.4

TABLE 3.—*Deliveries of New Non-alloy and Alloy Finished Steel.*

Product.	1959.	1960.	1960.	1916.	
			May.	April.	May.[5]
Non-alloy steel:					
Ingots, blooms, billets, and slabs[6]	5.1	5.6	5.7	6.9	7.3
Heavy rails ..	6.8	8.7	11.1	8.7	8.0
Sleepers	0.6	0.8	1.8	1.2	1.3
Fish and soleplates	0.4	0.6	0.9	0.4	0.9
Plates, 3 mm. thick and over ..	43.1	52.9	56.0	65.9	61.9
Other heavy prods.	41.2	53.1	53.2	57.7	52.6
Ferro-concrete bars	9.6	12.0	11.6	13.0	15.0
Wire rods	23.5	28.6	30.8	26.3	28.0
Arches, etc. ..	7.8	7.9	9.3	8.2	8.0
Other light sections	33.0	41.3	44.3	41.9	38.0
Bright steel bars ..	7.6	9.7	10.7	9.4	9.0
Hot-rolled strip ..	27.4	33.1	35.8	27.7	28.0
Cold-rolled strip ..	8.0	10.0	11.1	8.8	9.3
Sheets, incl. coated	47.0	53.5	56.8	48.0	49.3
Tinplate	20.9	22.4	24.6	18.8	19.3
Blackplate ..	0.7	0.9	1.0	0.7	0.6
Tubes up to 16 in.	20.6	23.8	26.7	24.2	21.8
Tube fittings, etc.	0.4	0.4	0.4	0.4	0.4
Tyres, wheels, axles	2.4	2.4	2.9	1.7	1.9
Forgings (excl. drop)	2.1	2.2	2.5	2.6	2.2
Steel castings ..	3.6	4.3	4.4	4.3	4.5
Tool steel	0.2	0.2	0.3	0.2	0.2
Total	312.0	374.4	401.9	377.0	367.5
Alloy steel	18.2	22.5	25.2	23.6	22.3
Total UK deliveries[7]	330.2	396.9	427.1	400.6	389.8
Add: Imported finished steel ..	7.1	19.1	25.5	5.8	3.5
Deduct: Intra-industry conversion[8] ..	337.3 47.6	416.0 56.4	452.6 62.2	406.4 52.4	393.3 51.7
Total new material	289.7	359.6	390.4	354.0	341.6

TABLE 4.—*Production of Pig-iron and Ferro-alloys.*

District.	Furnaces in blast.	Hematite.	Basic.	Foundry and forge.	Ferro-alloys.	Total.
Derbys, Leics, Notts, Northants, and Essex	20	—	27.1	19.1	—	46.2
Lancs (excl. N.-W. Coast), Denbighs, Flints, and Ches ..	8	—	22.4	—	2.3	24.7
Lincolnshire	10	—	45.1	—	—	45.1
North-East Coast ..	16	2.3	58.9	—	—	61.2
Scotland	7	2.0	20.7	1.1	—	23.8
Staffs, Shrops, Worcs, and Warwicks ..	5	—	9.1	1.1	—	10.2
South Wales and Monmouthshire	11	3.3	61.5	0.3	—	65.1
Sheffield	2	—	2.9	—	—	2.9
North-West Coast ..	7	16.8	—	1.4	—	18.2
Total	86	24.4	247.7	23.0	2.3	297.4
May, 1961[5]	85	23.4	249.6	23.3	3.9	300.2
June, 1960[5]	84	21.5	244.8	24.3	4.6	295.2

[1] The index for coal is now based on prices ruling on the last day of each month.

[2] Used in non-food manufacturing industries.

[3] Weekly average of calendar month.

[4] Stocks, mainly ingots and semi-finished, at the end of the year and months shown.

[5] Five weeks, all tables.

[6] Other than for conversion into any other form of finished steel listed.

[7] Includes finished steel produced in the UK from imported ingots and semi-finished steel.

[8] Material for conversion into other products also listed in this table.

British Blast Furnaces in the June Quarter, 1961

(These tables are published through the courtesy of the British Iron and Steel Federation.)

Derbyshire, Leicestershire, Notts, Northants, and Essex.

Name of firm.	In blast at end of the second quarter, 1961.					Weekly average in blast.	Total existing at end of quarter.
	Hematite.	Basic.	Foundry and forge.	Ferro-alloys.	Total.		
Ford Motor	—	—	1	—	1	1	1
Holwell Iron	—	—	1	—	1	1	3
Renishaw Iron	—	—	1	—	2	2	2
Sheepbridge	—	2	—	—	2	2	2
Stanton Ironworks: Stanton-by-Dale	—	1	4	—	5	5	5
Staveley Iron & Chemical	—	1	3	—	4	4	4
Stewarts and Lloyds: Corby	—	4	—	—	4	4	4
Wellingboro' Iron	—	1	—	—	1	1	3
TOTAL	—	10	10	—	20	20	24

Lancashire (excl. N.-W. Coast), Denbighshire, Flintshire, and Cheshire.

Brymbo Steel Works	—	1	—	—	1	1	1
Darwen & Mostyn Iron	—	—	—	2	2	1.9	2
Lancashire Steel Manufacturing	—	2	—	1	3	3	4
Summers, John	—	2	—	—	2	2	2
TOTAL	—	5	—	3	8	9	9

North-West Coast.

Barrow Ironworks	1	—	1	—	2	2	2
Charcoal Iron	—	—	1	—	1	1	1
Millom Hematite Ore & Iron	2	—	—	—	2	2	3
United Steel: Workington	2	—	—	—	2	2·6	3
TOTAL	5	—	2	—	7	7.6	9

Lincolnshire.

Appleby-Frodingham Steel	—	4	—	—	4	4	4
Lysaght's Scunthorpe Works	—	3	—	—	3	3	4
Thomas, R., & Baldwins: Redbourn	—	3	—	—	3	3	3
TOTAL	—	10	—	—	10	10	11

North-East Coast.

Consett Iron	—	2	—	—	2	2	3
Dorman Long (Steel): Acklam	—	2	—	—	2	2	4
Redcar	—	—	—	—	—	—	2
Bessemer	—	2	—	—	2	2	3
Clay Lane	—	2	—	—	2	2	2
Gjers, Mills	2	—	—	—	2	2	3
Skinningrove Iron	—	2	—	—	2	2	3
South Durham Steel & Iron: West Hartlepool	—	2	—	—	2	2	3
Cargo Fleet	—	2	—	—	2	2	3
TOTAL	2	14	—	—	16	16	26

Scotland.

Bairds & Scottish Steel: Gartsherrie	1	—	1	—	2	2	4
Carron	—	—	1	—	1	1	2
Colvilles: Clyde Iron Works	—	3	—	—	3	3	3
Ravenscraig	—	1	—	—	1	1	1
TOTAL	1	4	2	—	7	7	10

South Wales and Monmouthshire.

Guest Keen Iron & Steel: Cardiff	1	2	—	—	3	3	4
Thomas, R., & Baldwins: Ebbw Vale	—	3	—	—	3	3	3
Steel Company of Wales: Margam	—	5	—	—	5	4·2	5
TOTAL	1	10	—	—	11	10.2	12

Allied Reorganization

The directors and a number of senior executives of the subsidiary companies of Allied Ironfounders, Limited, were addressed by the chairman, Mr. G. S. Steven, at the Kensington Palace Hotel, London, on September 1. Speaking of the size of the group to-day, with more companies and a greater diversity of products, he said a very considerable amount of administrative work was involved in keeping in being some 30-odd companies, each as a separate legal entity. As from April 1, 1962, therefore, Allied Ironfounders will become an operating company, and subsidiary companies will be wound up, with the exception of overseas companies and U K companies in which there are outside minority interests. However, the descriptive titles of the works will be such as to retain old associations which, in the case of the Coalbrookdale Company, go back 250 years.

One effect of this reorganization will be that the title of managing director or director can no longer be applied to those in charge at the works of subsidiary companies, but Mr. Steven emphasized that this did not mean any change in the status or responsibility of any member of the staff of those works. To be consistent, the title of director will also cease to apply to the heads of sales divisions. This phase of reorganization will give legal recognition to the policy already in being of selling in the name of Allied Ironfounders under product divisions. In a later stage it is the intention to organize production under product divisions.

Design Appreciation

The Council of Industrial Design have announced two series of courses on the subject of design appreciation. The first, an engineering staff course, is intended for engineering draughtsmen, associated engineering staff and apprentices completing their training; it is intended to assist their appreciation of industrial design. It is also of use in helping to identify designing ability amongst the course members: where this is shown, recommendations for subsequent training can be made. This course is in two parts, and will be held in London from October 23 to 27, and from November 20 to 24.

A second course, from November 27 to December 1, has been prepared for engineering management, and should interest technical directors. This is the engineering executives' course, and covers the developing importance in engineering of aspects of industrial design and ways and means of improving it. This course will include talks by management representatives and industrial designers, who will outline some current approaches.

Further details about these courses are available from the Council of Industrial Design, 28, Haymarket, London, S.W.1.

Coseley Factory to Close

It was announced by Leyland Motors, Limited, on September 4 that the Coseley factory of Beans Industries, Limited, ironfounders, is to close and production transferred to the plant at Tipton. The official statement said that "As a result of the termination of certain contracts, Beans Industries has decided to close its Coseley factory during the next few months. Plant and equipment will be transferred to the Hurst Lane factory and employment will be available for the majority of the Coseley workers. As a result of this reorganization, however, a certain amount of redundancy is inevitable both as regards staff and works employees." It is understood that some 100 employees will be made redundant.

The foundries of Beans Industries are mainly occupied in making castings for the motor industry, and particularly Standard-Triumph International. About 700 have been employed at Coseley and of these the Tipton plant is expected to absorb about 600.

British Blast Furnaces in the June Quarter, 1961—*continued*

Staffordshire, Shropshire, Worcestershire, and Warwickshire.

Name of firm.	In blast at end of second quarter, 1961.					Weekly average in blast.	Total existing at end of quarter.
	Hematite.	Basic.	Foundry and forge.	Ferro-alloys.	Total.		
Goldendale Iron	—	—	1	—	1	1	2
Shelton Iron & Steel	—	3	—	—	3	3	3
Stewarts and Lloyds: Bilston	—	1	—	—	1	1	2
TOTAL	—	4	1	—	5	5	7
Sheffield.							
Park Gate Iron & Steel	—	2	—	—	2	1·9	2
GRAND TOTAL	9	59	15	3	86	85·6	110

Weekly Average Number of Furnaces in Blast during the June Quarter, 1961, and the Previous Four Quarters

District.	1960.			1961.	
	June.	Sept.	Dec.	March.	June.
Derby, Leics., Notts., Northants, and Essex	20.6	20.3	20.1	20	20
Lancs. (excl. N.-W. Coast), Denbigh, Flint, and Cheshire	6.4	6.9	7	7	7.9
Lincolnshire	8.4	9.3	10	10	10
North-East Coast	17	17.6	17.9	17.7	16
Scotland	6.9	7	7	7	7
Staffs., Shrops., Worcs., and Warwicks.	4.5	5	5	5	5
South Wales and Monmouth	11	10	10.2	10	10·2
Sheffield	2	2	2	2	1·9
North-West Coast	8	7	7.8	8	7·6
TOTAL	84.8	85.1	87	86.7	85·6

The following companies have furnaces in course of construction or rebuilding:—Dorman Long (Steel); South Durham Steel & Iron Company, West Hartlepool Works; Colvilles, Ravenscraig Works; Ford Motor Company; Barrow Ironworks; and R. Thomas & Baldwins, Spencer Works (two furnaces).

Day-release Education in Scotland

Day-release from employment for part-time education in Scotland is disappointing. Stating this, the second report of the Scottish Education Consultative Council expresses concern at the failure of the system to develop. At the invitation of the Secretary of State for Scotland, the Council have set up a committee to consider and promote "legislative and other measures that might be adopted."

In their report to the Scottish Secretary, they state: "While there are particular firms and industries in which the release principle is well supported, the measure of support throughout Scottish industry and commerce as a whole cannot be regarded as satisfactory so long as only about 10 per cent. of the insured population under the age of 18 are attending part-time day courses."

The report, which covers May 1960 to July 1961, also deals with the Council's scheme of training for 40 apprentices, which included three years' full-time education and two years in industry. The selection of entrants, who will receive the standard rates of wages when in training, will be made by the employers with guidance from a committee. The scheme—probably to be held in the West of Scotland—is essentially an experiment and the Council hope that it will show possible alternatives to traditional training.

Erratum. In the article "Italian Bronze Statuettes," August 24 issue of the JOURNAL, page 233, line 18, please read *figures* for *lettering*.

News in Brief

CHARLES G. THORNTON, LIMITED, will shortly be moving to their new non-ferrous foundry in Steward Street, Birmingham 18.

VENEZUELAN IRON-ORE EXPORTS to European countries rose from 1,590,000 tons in the period January-May 1960 to 2,070,000 tons in the same period of 1961. The principal buyers were Britain (852,800 tons), Western Germany (740,300 tons) and Italy (474,000 tons).

ARDEER FOUNDRY COMPANY, LIMITED, Ayrshire, has completed the first of a series of six 12-ton steelworks ladles which they recently secured on order from Sweden. The company won the order against strong competition from German and Swedish manufacturers of this type of equipment.

THE SCOTTISH PREMIERE of "Meals of Tomorrow"—a hospital catering film prepared for Allied Ironfounders, Limited—was screened in Glasgow on September 5. The film features the new "Ganymede" central tray-service system, manufactured by the company, largely at Falkirk.

THE VENEZUELAN MINISTER OF MINES recently visited Sweden to study the possibilities of creating an Organization of Iron Ore Exporting Countries with the aim of stabilizing selling prices. Other major producer countries that may become interested in such a project include Canada and Liberia.

MITSUBISHI METAL MINING COMPANY and Mitsubishi Shroji Kaisha have applied for permission to import capital totalling US $640,000 in the form of machinery and equipment to increase production at the iron-ore mine of the Cia. Minera Atacama, a subsidiary of the Mitsubishi group of Japan, in Chile.

MANCHESTER CARBORUNDUM COMPANY, LIMITED, contributed £250 towards the prizes for the angling section of the Sheffield and District Works Sports Association, whose "prize night" was on September 4 in the Balfour Works canteen, Wicker, Sheffield. The firm, which is celebrating its jubilee this year, also donated two solid-silver cups and five gold medals.

ORDERS FOR THE CONSTRUCTION of 800 bogies for 400 railway ore-trucks, to be used on the new Townsville-Mt. Isa railway line, have been placed with Queensland firms by the Queensland Railways Department. The bogies, which will cost nearly £600,000, will be built by Walkers, Limited, at Maryborough, and Queensland Electric Steel, Limited, at Moorooka, Brisbane.

THE FIRST INDUSTRIAL APPEALS in Renfrewshire—believed to be the first in Scotland—against new valuations were heard recently in Paisley by Renfrewshire Valuation Court. Appeals from 20 firms were listed for hearing, two appealed in respect of stores, one for their office premises and the remaining 17 over their whole factory premises. All appeals were successful.

AT THE DURGAPUR STEELWORKS in West Bengal, built by ISCON (the British Consortium) for the Government of India, the continuous merchant mill—the fifth and last unit of the rolling-mills plant—has undergone successful commissioning trials in the rolling of merchant bars. Tonnages from the mill are increasing steadily and the best daily output achieved to date has been 251 tons.

"THE CASE for Steel Castings" and "Metallurgy applied to the Selection of Metals" are among papers to be presented at the Conference to be held concurrently with the Engineering Materials and Design Exhibition (Earls Court, London, November 13 to 17). Other subjects of some interest to founders are the use of æsthetics in machine design and the influence of corrosion on the design of chemical plant.

EMPRESAS SUDAMERICANAS CONSOLIDADAS, of Panama, has been authorized to import capital of US $3,000,000 for investment by the Empresa Minera Mantos Blancos in its copper mine in the Province of Antofagasta, Chile. If necessary, the Chilean mining company may issue debentures for the US $3,000,000, to be subscribed totally or partially by the Empresas Sudamericanas Consolidadas, by the International Finance Corporation or by other foreign finance organizations.

SHEFFIELD CITY POLICE, with 246 points, were the winners of the ambulance corps first-aid competition of General Refractories, Limited, held at the Victory Hall, Stocksbridge, on September 2. South Leicester Colliery were second (229 points); Whitwick Colliery, third (216), and Dodworth Colliery, fourth (171). Amongst other prize-winners was Jessop-Saville Steel Works, Limited. Mr. J. J. Chilvers of the English Steel Corporation, Limited, received an individual award.

WATTS METAL INDUSTRIES, LIMITED, boiler manufacturers of Lydney, Gloucestershire, announce a change of telephone numbers to Lydney 436 and 437. Also trading as Watts Automatic Boilers, and a member company of the Allied Ironfounders' group, Watts Metal Industries manufacture a wide range of industrial and automatic stokers, under their own name, and the Aga GF (gravity-feed) domestic boilers. All are marketed through Aga heating division of Allied Ironfounders, Limited.

MASSEY-FERGUSON'S new associate company in India, Tractors & Farm Equipment, Limited, Sembiam, Madras, is now producing M-F.35 tractors. It is a medium h.p. tractor, powered by locally manufactured Perkins diesel engines, and already some 16,000 are operating in India—nearly one half of the total Indian tractor population. It was at the beginning of this year that Massey-Ferguson announced the formation of the Indian company, in which they have a substantial minority interest.

AUSTRALIAN SHIPYARDS in the next 3½ years will complete 13 new ships totalling 130,000 d.w.t., built for the Australian Government or commercial owners. The construction of three other ships for Australian and New Zealand owners is also being considered. Those already on the stocks range in size from lighthouse supply ships of 800 tons to a 32,000-ton tanker. Four of the 13 are bulk ore carriers of from 16,000 to 21,000 tons, for the Broken Hill Pty. Company. Two others are vehicular ferries, and one a naval survey ship.

SIX MEMBERS of the China National Metals and Minerals Import and Export Corporation have visited Sheffield steelworks. On September 6 they went to the English Steel Corporation, Limited, and saw the Siemens melting department, cogging mills, heavy forge, plate mill, C.G.F. plant, East machine shop, Brightside Lane machine-shop and the Tinsley Park works. On the following day the party, whose organization is responsible for the steel-buying of Communist China, toured the works of Firth-Vickers Stainless Steels, Limited.

THE AEI/DAVY UNITED STEELWORKS AUTOMATION UNIT, which was formed in July 1960, to apply automation to the processing of steel and non-ferrous metals, will trade in its own right in future. The interests of Associated Electrical Industries and Davy-

Ashmore in this field are now combined in a jointly-owned company, Davy-AEI Automation, Limited. The chairman of the new company is Mr. M. A. Fiennes, managing director of Davy-Ashmore, and the vice-chairman is Mr. C. R. Wheeler, vice-chairman of AEI. The company's headquarters will be at Booths Hall, Knutsford, Cheshire.

GLASGOW PLANNING COMMITTEE have instructed the town clerk to open negotiations with Weir Foundries, Limited, Pontefract, about acquiring their disused foundry at Thornliebank. Councillor George Robertson, planning convener, said the buildings were offered to the Corporation some time ago, and if the Corporation did acquire them they could be used to house industries displaced under the city's development scheme. Originally built between the wars by G. & J. Weir, Limited, Glasgow engineers, the foundry was considerably extended and at one time employed several hundred workers. Some years ago the buildings were acquired by the Yorkshire firm and more than a year ago the factory closed.

A SCOTTISH FIRM with advanced "know-how" on electronic equipment is winning increasing contracts from the US, including orders for specialized machinery connected with the radar system from the US Navy. The firm is James Scott (Electronic Engineering), Limited, of Glasgow, a subsidiary of James Scott (Electrical Holdings), Limited, which carried out the electrical installations at Dounreay, where 600 men were employed. Five years ago the electronic side of the firm's operations was carried on by a staff of 50 in a factory of 16,000 sq. ft. To-day both staff and floor space have increased sevenfold. On the scientific side 25 graduates, mostly from Scottish universities, are continuing the technical progress in electronics.

AS PART OF ITS EFFORT to stimulate interest in technical education, Sheffield and District Engineering Trades Employers Association is donating prizes to technical colleges within its area, to be awarded annually to part-time engineering students. The colleges are: Granville College of Further Education (£10); Doncaster Technical College (£6); Rotherham College of Technology (£5); Chesterfield College of Technology (£5); West Nottinghamshire Technical College, Mansfield (£5); Barnsley College of Technology (£5); Sheffield College of Technology (£5); North Lindsey Technical College, Scunthorpe (£4); Schofield Technical College, Mexborough (£2); Worksop County Technical College (£2); and Clowne Technical College (£2).

Recent Wills

HALL, J. H., a director of Hall & Kay, Limited, air conditioning engineers, of Ashton-under-Lyne ...	£135,792
ROBINSON, NOAH, joint managing director of the Willenhall Motor Radiator Company, Limited ...	£44,635
MERRICK, R. H., a director of R. Merrick & Sons, Limited, engineers and ironfounders, of Cork (Eire)	£15,948
MACQUEEN, J. G., of Tettenhall, near Wolverhampton, and formerly a sales executive with Allied Ironfounders, Limited	£5,252
MESSENGER, A. H., sales director of George Crossley, Limited, ironfounders, wire drawers, etc., of Cleckheaton (Yorks)	£7,779
LEGGETT, ARTHUR, chairman of E. R. & F. Turner, Limited, ironfounders and makers of milling machinery, of Ipswich (Suffolk)	£48,338
KING, JOHN, chairman and founder of John King & Company (Leeds), Limited, malleable ironfounders, colliery engineers, etc.	£38,162
VARLEY, JOSEPH, for more than 20 years company secretary of Richard Firth & Sons, Limited, textile machinery manufacturers, of Cleckheaton Yorks)	£6,373

Company News

Wellman Smith Owen Engineering Corporation

Negotiations are now proceeding with a view to expanding still further activities in the field of oxygen steelmaking processes by the Wellman Smith Owen Engineering Corporation, Limited, states Sir Peter Roberts, MP, chairman, in his annual review. The group continues to experience a considerable demand, both home and overseas, for plant and equipment for the metallurgical industries. There had, however, recently been evidence of increasing competition and pressure on margins.

The order-book, Sir Peter continues, now exceeded £11,000,000 and contracts had been received from both home and overseas for plant and machinery spread over the whole range of the group's products. In particular, there had been a substantial volume of orders for plant and equipment in which the Incandescent Heat Group specialized.

A further satisfactory feature was the expanding demand for the group's mobile forging manipulators, particularly in the export field where the keenest competition was encountered. In the Ross valve division sales had increased by 20 per cent. during the year. The merger with the Incandescent Heat Company, Limited, had added a number of active and progressive undertakings to the group and full advantage was being taken of the combined resources on technical sales at home and abroad.

Group net profit for the year to March 31, 1961, rose from £835,399 to £938,671 and the dividend is maintained at 25 per cent. A one-for-seven scrip issue is proposed in order to maintain the issued share capital more closely in line with the assets employed in the business.

GEORGE KENT, LIMITED, industrial instrument and automatic control manufacturers, of Luton—Looking at the present year, the chairman, Cmndr. P. W. Kent, states in his annual review that orders for the first four months showed a marked improvement compared with last year and the invoice output of the new electronic instruments also shows a "very reasonable increase."

GOODLASS WALL & LEAD INDUSTRIES, LIMITED—The company, through its subsidiary, Fry's Diecastings, Limited, has acquired from the British Oxygen Company, Limited, for an undisclosed amount payable in cash, the assets and goodwill of its die-casting business, formerly a division of Sparklets, Limited. The transaction does not affect the business of Sparklets as makers of fire tubes and other small gas cylinders, inflation apparatus, etc.

JOSIAH PARKES & SONS, LIMITED, manufacturers of locks and brassfounders, of Willenhall (Staffs)—Resolutions to be put before an extra-ordinary general meeting on September 25 will propose that the name of the company be changed to Josiah Parkes & Sons (Holdings), Limited, and that the capital be increased to £1,000,000 by the creation of 500,000 new shares of 10s. each. Josiah Parkes & Sons will continue manufacturing and trading as a wholly-owned subsidiary.

STANDARD RANGE & FOUNDRY COMPANY, LIMITED—The board has declared an unchanged interim dividend of 6¼ per cent., less income tax, on the ordinary share capital of £250,000 in respect of the year ending December 31, 1961, payable to shareholders registered on August 30, 1961. Since the end of the financial year, it is stated, the company has continued to trade satisfactorily despite keen competition, and the board looks forward to the coming months with confidence.

Raw Material Markets

Iron and Steel

Outputs of iron castings are maintained at fairly good levels, but there is little if any improvement on recent demands which overall are well below the productive capacity of the foundries. The engineering and speciality foundries, while continuing to be the most favourably employed on high-quality castings, are finding it difficult in some cases to maintain a five-day working week, now that arrears of work have been liquidated and production depends mainly on day to day arisings of orders. The motor vehicle industry maintains a regular demand but well below former levels, and from the engineering and machine-tool industries, power and electrical plant manufacturers and other users, fairly good demands are being made, although on a fluctuating basis.

Outputs of castings at the light foundries continue at recent levels, but much more business could be undertaken, particularly at those foundries which supply to the domestic utensil trade. It is hoped that seasonal influences will bring some increase on present demands. The call for castings from the building trades has so far been well maintained.

There is no scarcity in the supply of all grades of pig-iron. The steelworks are well provided with their requirements of basic pig-iron, and outputs are controlled by demands. These are now well below capacity levels, and the present reduced consumption has resulted recently in further cuts in production. The foundry grades of pig-iron are also available in larger quantities than those now being called for, and deliveries from most producers could be stepped up appreciably if the call warranted.

There is little if any improvement in business at the re-rollers, and only moderate demands continue to be made for their products, apart from reinforcing rods and bars which are being specified in appreciable quantities. Most of the mills are badly in need of more business for small bars, light sections, strip, etc., as present arisings are barely sufficient to make up rolling programmes and they have difficulty in keeping production at present levels. Some export business is being undertaken, but orders from overseas buyers are difficult to obtain against competition from makers abroad.

All the steel semis they require are readily available in both mild and carbon qualities, and home steelworks have tonnages to spare after present demands have been met. Adequate supplies of alloy steels can also be obtained, but for more extended delivery.

Non-ferrous Metals

Tin remains the highlight of the non-ferrous metal markets, attention now being focused on the request by the General Services Administration Department to Congress to waive the six-month waiting period required for release of metal from one of the national stockpiles. Since this request involves the release of 50,000 tons of tin metal, the tin markets are naturally nervous and the price has slumped by almost £60 a ton from its previous level which was within sight of £1,000 a ton.

Nevertheless, demand continues steady in the UK, the US, and in the East. The good outlook for the metal was underlined by the drop in stocks in LME warehouses last week by a further 102 tons to 5,526 tons which is almost half the figure which was held earlier in the year. The consumption of tin in the United States in June increased by 2 per cent. to 6,790 tons, although stocks also rose slightly. The US price has dropped sharply and now stands somewhat unsteadily at around $1.20 cents a pound.

Copper is now a better market in the US than in the UK, or on the Continent. Demand has firmed up and producers and custom smelters have little metal to offer for nearby delivery. Moreover the custom smelter intake price for scrap has risen to 26¼ cents a pound and dealer copper is reported to be changing hands at a slight premium. The US price is unchanged at 31 cents a pound.

The copper market in London continues to be featureless. This is even more marked since the settlement of all outstanding labour disputes in the copper producing industry in the States and in Chile. The uneasy political position in the Rhodesias has not affected output from the Copperbelt, but the Congo is still far from settled and the production and shipment picture from that country is not clear. With regard to the outlook there is the growing feeling that London prices are too low and that the quotation will begin to rise around the end of this month.

Lead is dull in London with the price fairly steady around £64 a ton. The market in the US is steady with the New York spot price unaltered at 11 cents a pound.

Zinc, too, is a better market in the US than in this country but the quotation is still 11¼ cents a pound, compared to the London price of around £73 a ton.

Caravan Exhibition

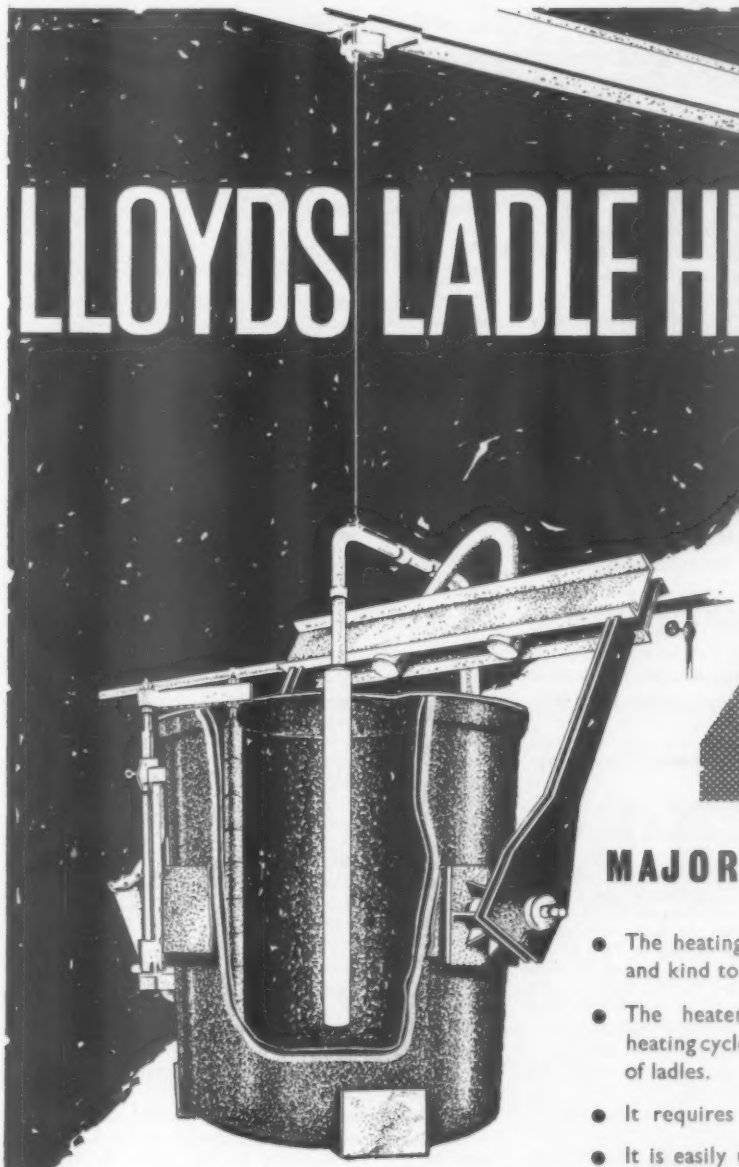
At the International Caravan Exhibition, which opens at Earls Court, London, on September 20 for ten days, over 200 caravans of every size, price and design will be on display. On stands throughout the hall all the amenities and accessories essential to caravan life will be shown. Caravanning is now big business: It is estimated that more than 4,000,000 people will have taken a caravan holiday in Britain in 1961; throughout the country, there are more than 3,600 caravan parks varying from the ultra-modern with baths, showers, electric lighting, mains water, flush sanitation, television, shops and sports facilities, down to the temporary sites. Exports of caravans for the first six months of 1961 are almost equal to the whole of 1960 (£1,155,350 against £1,185,915 for last year). For the foundry industry, caravan business means another market for specialized cooking and heating appliances and other accessories.

Asbestos for Preventing Core Erosion

A short article in the *Journal d'Informations Techniques des Industries de la Fonderie* deals with the use of thin asbestos sheets for enveloping cores used in the bronze foundry. The cores are usually made from moulding sand blacked and dried. One method of sticking asbestos sheets to the cores, fairly generally used it is stated, is to use a "soup" made from potato parings, having the consistency of a thick oil and used hot. Other methods involve the use of wire and nailing. The application of asbestos covering for cores is for cases where there is a danger of erosion by the liquid metal.

IT WAS REPORTED in our August 31 issue (p. 268) that Mr. F. J. Howard of the Globe Pneumatic Engineering Company, Limited, had relinquished the posts of works manager and technical director, whereas in fact he has relinquished the former post and in his capacity as technical director will concentrate on design.

LLOYDS LADLE HEATER



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MAJOR ADVANTAGES

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- It is easily used and maintained.

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MARSHALL

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Current Prices of Iron, Steel, and Non-ferrous Metals

(Basis prices, delivered unless otherwise stated. Prices following side headings marked* are subject to an increase of 1 per cent. under Iron and Steel Board Price Determination, 1961, No. 2.)

September 13, 1961

PIG-IRON

* **Foundry Iron.**—No. 3 IRON, CLASS 2, 10-ton lots or over, Middlesbrough, £21 17s. 0d.; Birmingham, £21 9s. 3d.

* **Low-phosphorus Iron.**—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham; £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

* **Hematite.**—Si less than 2 per cent, S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 9s. 0d.; Birmingham, £25 13s. 0d.; South Wales (Welsh iron), £23 19s. 0d.

* **Basic Pig-iron.**—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(*per ton unless otherwise stated, delivered*)

Ferro-Silicon (6-ton lots and over).—45 per cent. Si, £45 0s. 0d. to £48 0s. 0d., scale 15s. 0d. per unit, lumpy, 75 per cent. Si, £62 10s. 0d. to £66 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 14s.1d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 10s. 3d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 13s. 3d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £80 10s. 0d. to £84 10s. 0d., basis 60 per cent. Cr scale 27s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £79 0s. 0d. to £82 10s. 0d., basis 60 per cent. Cr, scale, 27s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent. C,* 1s. 8d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr.; 0.10 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.06 per cent. C,* 1s. 10½d. to 2s. 1d. per lb. Cr. * Average 68-70 per cent.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent. Cb + Ta, 19s. 0d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £58 10s. 0d.

SEMI-FINISHED STEEL

* **Re-rolling Billets, Blooms, and Slabs.**—BASIC: Soft u.t., 100 tons and over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 100 tons and over, £32 5s. 6d.; hard (0.41 to 0.60 per cent. C), 50 tons and over, £33 17s. 0d.; silico-manganese, 50 tons and over, £42 16s. 6d.; free-cutting, 50 tons and over, £35 4s. 6d. SIEMENS MARTIN ACID (50 tons and over): Up to 0.25 per cent. C; £40 11s. 0d.; silico-manganese, £43 4s. 0d.

* **Billets, Blooms, and Slabs for Forging and for Stamping** 50 tons and over).—BASIC: Soft, up to 0.33 per cent. C, £37 0s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £38 2s. 6d.; acid, up to 0.25 per cent. C, £41 14s. 0d.

FINISHED STEEL

* **Heavy Plates and Sections** (50 tons and over).—Ship plate (N.-E. Coast), £40 7s. 0d.; boiler plates (N.-E. Coast), £42 17s. 0d.; floor plates (N.-E. Coast), £41 16s. 0d.; angles (N.-E. Coast), £38 1s. 6d.; joists (N.-E. Coast), £37 17s. 6d.

* **Small Bars, Sheets, etc.**—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 6d.; under 4 tons to 2 tons, £41 3s. 6d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £67 4s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £67 16s. 0d.; nickel-chrome, £100 18s. 0d.; nickel-chrome-molybdenum, £113 11s. 0d., in lots of 25 tons and over.

NON-FERROUS METALS

Copper.—Cash, £232 10s. 0d. to £232 15s. 0d.; three months, £235 10s. 0d. to £236 0s. 0d.; settlement, £232 15s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 3½d. per lb. rods, 249s. 0d. per cwt. basis; 20 s.w.g., 284s. 0d. per cwt.

Tin.—Cash, £952 0s. 0d. to £953 0s. 0d.; three months £959 0s. 0d. to £960 0s. 0d.; settlement, £953 0s. 0d.

Lead (Refined Pig).—First half September, £64 0s. 0d. to £64 2s. 6d.; first half December, £65 15s. 0d. to £65 17s. 6d settlement, £64 2s. 6d.

Zinc.—First half September, £72 5s. 0d. to £72 7s. 6d.; first half December, £73 0s. 0d. to £73 5s. 0d.; settlement, £72 7s. 6d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £110 7s. 6d.; rolled zinc (boiler plates), all English destinations, £108 12s. 6d.; zinc oxide (Red Seal); d/d buyers' premises, £92 10s. 0d.

Brass Tubes, etc.—Solid-drawn tubes 1s. 10½d. per lb.; sheets to 10 w.g., 198s. 9d. per cwt.; wire, 2s. 8¾d.; rolled metal, 198s. 9d. per cwt.

Brass (Brazing).—BS1400, B3, £176; B6, £222.

Brass (High Tensile).—BS1400, HTB1, £194; HTB2, £213; HTB3, £229.

Gunmetal.—BS1400, LG2, £217; LG3, £227; G1, ½% £300; G1, 1%, £290.

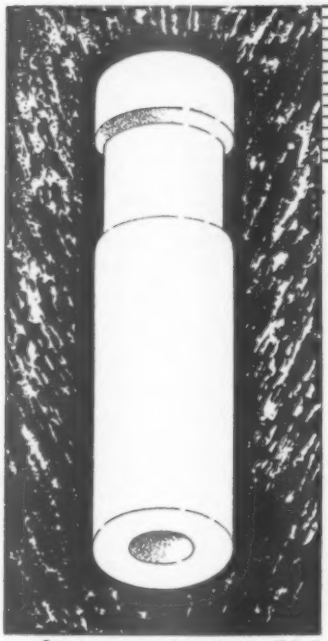
Phosphor Bronze.—BS1400, PB1 (AID released), £307; BS1400, 90/10/1, £305.

Leaded Phosphor Bronze.—BS1400, LPB1, £241.

Phosphor Bronze Strip, etc.—Strip, 303s. 9d. per cwt.; wire, 4s. 2½d. per lb.; rods, 3s. 5½d.; tubes, 3s. 5½d.; chill cast bars, solids 3s. 6½d.; cored, 3s. 7½d. (CHARLES CLIFFORD LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 11½d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 4½d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 3½d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 2½d. to 2s. 3d. per lb.; Antimony, English, 99 per cent., £230 0s. 0d. Quicksilver, ex-warehouse, £63 0s. 0d. Nickel, £660 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £243; AB2, £251.



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MADE IN HYLUMINA,
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- Will outlast more than a dozen chilled iron nozzles
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- Fit direct into the hose and are held by a clip —require no holder

For details write to:

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Imports and Exports of Iron and Steel in July

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in July this year. Totals for the first seven months of 1960 and 1961 are also included.

Total Exports of Iron and Steel

Destination.	Month ended July 31,	Seven months ended July 31.	
	1961.	1960.	1961.
	Tons.	Tons.	Tons.
Malta	206	3,935	3,250
Sierra Leone	538	3,135	6,447
Ghana	959	11,394	10,405
Nigeria	3,476	37,189	42,193
Union of South Africa	6,239	43,922	39,069
South-West Africa	1,205	4,866	9,416
Rhodesia and Nyasaland	1,498	15,191	20,148
Tanganyika	2,636	8,478	17,567
Kenya	4,545	17,550	25,574
Uganda	142	718	1,694
Mauritius	105	2,731	1,342
Bahrein, Qatar, and Trucial States	2,605	8,496	12,644
Kuwait	597	4,777	11,523
India	14,167	166,740	122,268
Pakistan	7,653	42,240	55,535
Singapore	1,178	11,774	16,043
Malaya	1,639	11,467	15,662
Ceylon	2,329	32,080	25,953
British North Borneo	165	2,531	1,335
Hongkong	8,783	48,940	49,777
Australia	6,493	100,522	87,739
New Zealand	14,683	62,708	157,199
Canada	8,774	139,348	80,087
Jamaica	948	14,269	10,064
Trinidad	4,268	26,796	27,186
British Guiana	431	5,421	5,709
Other Commonwealth countries	3,197	15,783	18,012
Eire	7,430	35,443	44,900
Soviet Union	1,722	20,108	13,662
Finland	5,033	28,201	35,975
Sweden	10,142	106,827	100,310
Norway	12,822	69,977	79,770
Denmark	11,829	59,270	60,577
Poland	4,929	6,769	17,578
Western Germany	13,675	87,404	65,827
Eastern Germany	2,017	14,721	15,932
Netherlands	8,110	77,712	78,127
Belgium	3,170	22,295	17,923
France	627	4,682	7,743
Switzerland	1,168	7,555	13,458
Portugal	2,675	9,324	16,011
Spain	2,485	31,027	14,145
Italy	6,210	24,917	40,541
Austria	484	3,095	3,196
Yugoslavia	834	24,102	19,911
Greece	2,656	11,766	21,837
Turkey	1,486	7,589	10,940
Netherlands Antilles	628	2,434	1,062
Portuguese East Africa	242	2,773	1,626
Egypt	3,255	6,975	20,425
Libya	866	10,564	5,786
Sudan	962	5,831	6,143
Israel	1,308	12,307	13,986
Saudi Arabia	76	263	822
Iraq	1,607	18,606	23,803
Iran	1,806	43,339	20,208
Burma	319	4,314	3,306
Thailand	452	3,545	3,447
Indonesia	68	17,320	2,659
China	12	35,691	10,097
Japan	19,049	43,662	104,545
Philippine Republic	483	5,345	2,854
USA	10,676	148,558	75,924
Cuba	29	5,452	956
Mexico	291	4,314	2,449
Colombia	1,519	5,949	7,394
Venezuela	4,141	24,261	17,253
Ecuador	209	1,609	1,764
Peru	443	4,404	5,140
Chile	136	2,187	2,187
Brazil	948	21,180	11,585
Uruguay	343	5,271	5,274
Argentina	19,813	57,338	105,092
Other foreign countries	5,904	36,861	44,594
TOTAL	274,548	2,026,173	2,052,585

Mr. D. N. SADLER has been elected a director of S.G.B. (Dudley), Limited.

Total Imports of Iron and Steel

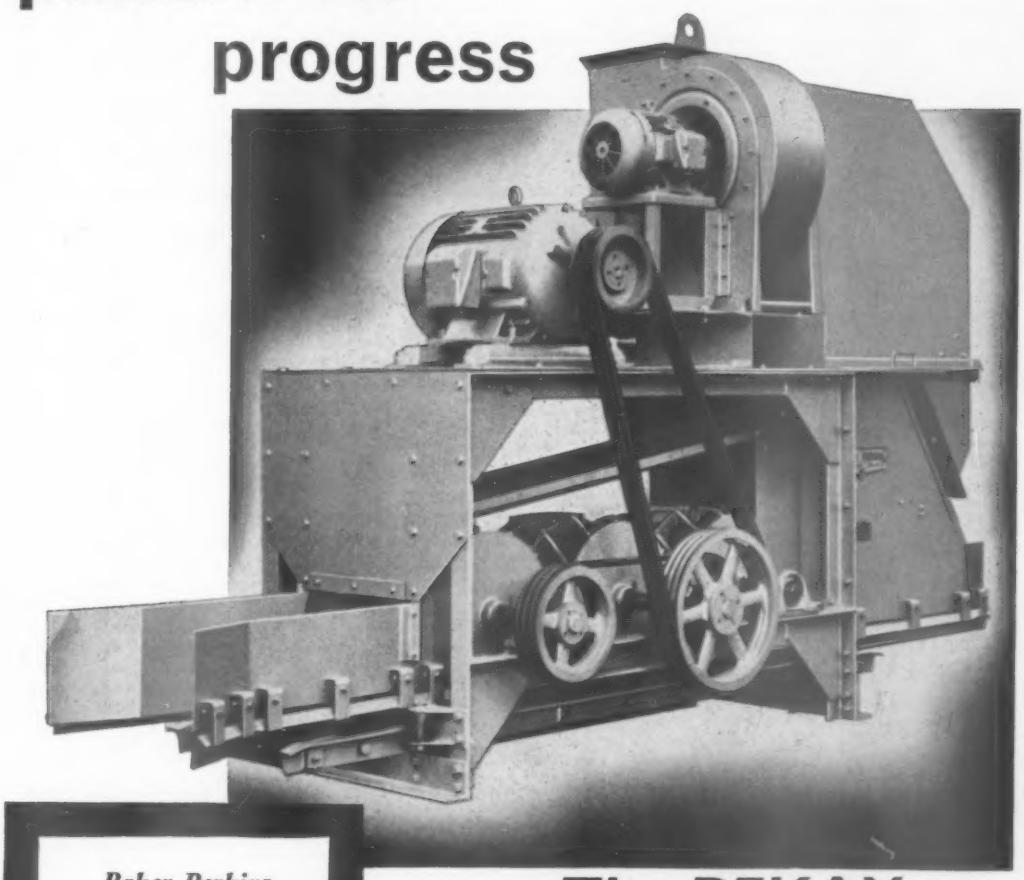
From	Month ended July 31.	Seven months ended July 31.	
	1961.	1960.	1961.
	Tons.	Tons.	Tons.
Union of South Africa	2,322	20,877	22,009
Rhodesia and Nyasaland	126	4,325	17,550
Canada	3,903	95,206	64,012
Other Commonwealth countries and Eire	16,173	21,914	33,467
Soviet Union	—	22,811	9,914
Sweden	2,381	28,573	30,066
Norway	9,441	89,843	69,694
Poland	—	8,056	652
Western Germany	1,163	90,695	16,979
Netherlands	9,324	129,409	69,492
Belgium	1,206	73,272	23,627
Luxembourg	111	9,530	10,130
France	987	42,099	12,432
Italy	40	18,443	306
Austria	514	7,845	3,268
Japan	502	4,015	4,402
USA	510	252,405	8,344
Other foreign countries	916	59,368	7,536
TOTAL	49,619	978,686	403,880
Iron and steel scrap and waste fit only for the recovery of metal	883	97,834	12,744

Exports of Iron and Steel, by Product

Product.	Month ended July 31.	Seven months ended July 31.	
	1961.	1960.	1961.
	Tons.	Tons.	Tons.
Pig-iron	12,699	102,095	61,428
Ferro-columbium (niobium)	14	78	51
Ferro-tungsten	76	514	657
Other ferro-alloys	377	6,172	2,249
Ingots, blooms, billets, slabs, sheet bars (incl. tinplate bars) and similar primary forms	12,518	20,792	67,674
Pieces roughly shaped by forging	212	775	1,523
Iron bars, rods, angles, shapes, and sections	291	1,102	1,414
Steel bars, rods, angles, sections, and shapes	54,214	378,057	417,097
Iron plates and sheets	16	527	318
Universal plates	1,687	13,004	10,143
Steel plate, 3 mm. and under 4.5 mm. thickness	2,697	24,344	22,869
Ditto, 4.5 mm. or more in thickness	32,176	204,516	212,961
Blacksheets and blackplate	27,739	179,402	225,390
Hoop and strip	8,885	70,511	72,251
Tinplate	38,581	316,852	263,171
Decorated tinplate	390	2,970	3,975
Galvanized sheets	5,707	49,991	43,394
Other (incl. tinned sheets, terneplate, and ternesheets)	3,410	15,746	24,539
Railway and tramway construction material	9,844	102,415	124,133
Wire rods of steel (incl. alloy steel)	3,368	33,437	37,891
Wire	11,479	72,143	81,519
Tubes, pipes, and fittings	48,174	440,730	377,956
TOTAL	274,548	2,026,173	2,052,585

MR. W. E. A. REDFERN, managing director, English Steel Corporation, Limited, Sheffield, presented the directors' trophy and prizes at the 17th annual garden produce show at the Bellhouse Road sports pavilion of the company on September 2 when there were more than 400 exhibits.

pattern for progress



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Foundry Machinery

The PEKAY aerator/coolerator

* Continuously processes and conditions foundry sand * Fits flat, troughed, horizontal or inclined rubber belt conveyors. * Specially designed undercarriage does not increase wear or tension on belt. * Cheaply and quickly installed. One of the range 10 tons to 450 tons. 18″ to 48″ wide belts. * Increases output and improves quality from existing mixing plant.

Write for further details of Baker Perkins Pekay Aerators/Coolerators to :

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Foundry Machinery Department, Bedewell Division, Hebburn-on-Tyne, Co. Durham. Tel. Jarrow 897124

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SITUATIONS WANTED

FOUNDRY MANAGER (31), H.N.C., National Foundry College Diploma, desires new appointment with reputable company preferably in South or South Midlands. Able to work on own initiative. Thorough knowledge of most modern processes. Box FM937, FOUNDRY TRADE JOURNAL.

WORKS / PLANT ENGINEER (40), shortly available. 21 years experience in large light alloy foundry layouts, sand; gravity; pressure; cores; toolroom. Fully conversant all aspects of plant selection, development, installation, services and building construction and engineering D.O. Preferably South Bucks or near. Box WP944, FOUNDRY TRADE JOURNAL.

FOUNDRY EXECUTIVE, 41, with personality and drive, seeks position Midlands. (Time served patternmaking and foundry apprenticeship.) Fully experienced all branches non-ferrous and grey-iron, works management, sales. Large business connections. Box FE952, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

SOUTH COAST Ferrous and Non-ferrous Foundry requires young REPRESENTATIVE for Southern England. Please give age, experience and salary required. Box SC947, FOUNDRY TRADE JOURNAL.

TECHNICAL SALES REPRESENTATIVE. Opportunity occurs in Company specializing in High Quality Grey Iron Castings, mainly for Shell Moulding, also Sand Castings. Would be willing to train suitable applicant, who should have engineering and foundry experience, and must have pleasing personality, possess initiative, and have confidence to make fresh contacts in a competitive market. Full details, in confidence, of age, experience and salary required, also date when available, to Box TS930, FOUNDRY TRADE JOURNAL.

ASSISTANT FOREMAN for Grey Iron Foundry in Birmingham Area on jobbing and batch production up to 20 cwts. Experience on Sand Control and modern foundry procedure. Position offers excellent prospects to young man possessing drive and initiative. Box AF914, FOUNDRY TRADE JOURNAL.

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An EXPERIENCED ESTIMATOR is required for Midlands Grey Iron Foundry.

Applicant must be conversant with volume production in mechanised plant.

This PERMANENT STAFF POSITION is SUPERANNUATED.

Apply BOX SF 931, FOUNDRY TRADE JOURNAL.

A FOUNDRY MAINTENANCE FOREMAN is required to back up the Maintenance Engineer by assuming control of all direct foundry maintenance. Applicants for this post should be between the ages of 35 and 45 and should already be occupying a position of responsibility. Experience of machine building and erection will be a distinct advantage. This post requires a man of considerable ability who will be able to accept further promotion. Application should be addressed to: THE GENERAL MANAGER, C. & B. SMITH LIMITED, Stewart Street, Wolverhampton, marked Ref. M.F.

FOUNDRY UNIT ENGINEER required to be responsible for the control of design, plant manufacture, installation and maintenance of a new foundry process. Qualifications required—H.N.C. minimum; membership of a professional institution would be an advantage. Experience in non-ferrous foundry engineering would be considered an asset but is not essential. Age range 25-35 years. Salary scale £1,050—£1,300 per annum. Applications should be sent to the PERSONNEL MANAGER, DUALLOYS LTD., Boden Street, Chard, Somerset.

PRACTICAL MAINTENANCE ENGINEER, preferably with some administration experience, for small iron foundry in North Staffordshire. Interesting position with prospects for ambitious person willing to co-operate with Director on production planning, etc. Scope for travel if interested. We are NOT looking for a man who wishes to remain purely a maintenance engineer. Genuine applications only, in confidence, stating fullest details of experience. Box PM929, FOUNDRY TRADE JOURNAL.

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AND
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of H.N.C. or L.I.M. Standard are required for our Laboratories situated on the South Coast and the fringe of the New Forest. Experience in any of the following would be an asset:-

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Opportunities exist in all our manufacturing fields, with scope for interesting research and development work.

Applications stating, age, qualifications and experience to:

THE CHIEF METALLURGIST,
WELLWORTHY LTD.,
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METALLURGIST
FOR SOUTH AFRICA

Applications are invited from suitably qualified persons, age 30 to 45, to fill the above position at a large production Foundry situate near Johannesburg. A wide experience in modern blackheart and pearlitic malleable and grey iron production methods is essential. Experience of pipe fittings, automotive castings and radiographic inspection methods will be a strong recommendation. Salary range £1,800 to £2,100 per annum. A Pension and Medical Aid Scheme is available. The Company is prepared to offer financial assistance to the successful applicant and family to meet costs of passage fares to South Africa. The position offers excellent prospects to the man with the requisite experience and organising ability.

Apply in writing to:—The Secretary,
ASSOCIATED ELECTRICAL INDUSTRIES OVERSEAS LIMITED,
33 Grosvenor Place, London, S.W.1

SITUATIONS VACANT—*contd.*

senior methods engineer

Applications are invited for the position of Senior Methods Engineer with a leading South Wales Steel Foundry. This position calls for a detailed knowledge of methods along with the ability to discuss design problems with customers. A knowledge of piecework, rate-fixing and estimating would be advantageous. The Company operates a Staff Superannuation Scheme. This is a staff appointment. The salary will depend upon age and experience. Replies, which will be treated in confidence, and which should give full details of age, experience and qualifications, to the Works Manager, Brown, Lennox & Co. Limited, Pontypridd, Glamorgan.

CHIEF INSPECTOR required by a Non-ferrous and Aluminium Foundry. A.I.D. and metallurgical experience preferred. Apply to GROVE FOUNDRY LTD., Stangrove Works, Mill Lane, Alton, Hants.

FOUNDRY Equipment Manufacturers require REPRESENTATIVE in Yorkshire. Please apply to Box FE941, FOUNDRY TRADE JOURNAL.

COST ACCOUNTANT required for West Midland Iron Foundry. Excellent prospects for keen and ambitious man with experience in the installation of new systems. Write giving full particulars and salary required. Box CA913, FOUNDRY TRADE JOURNAL.

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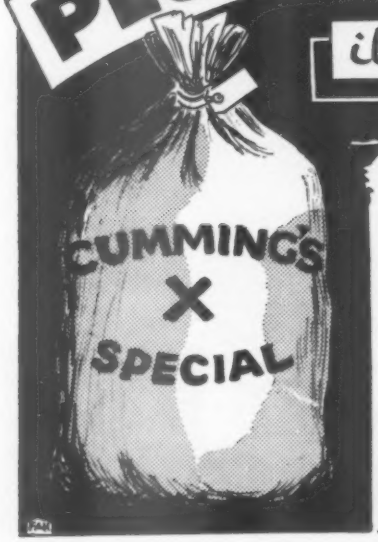

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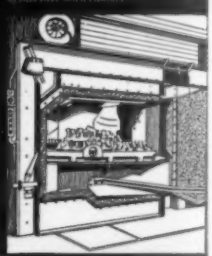

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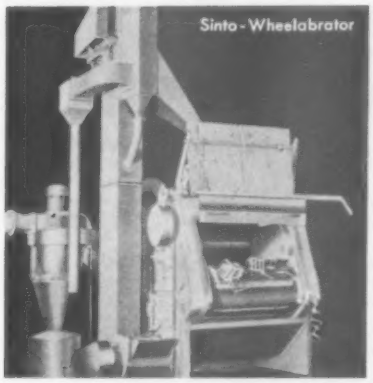

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INDEX TO ADVERTISERS

PAGE NOS.

A.E.I.-Birlec, Ltd. .. —
A.E.I. Plastics (Aldridge) Ltd. .. —
Acme Conveyors, Ltd. .. 11
Air Control Installations Ltd. 65
Albion Diemakers Ltd. .. —
Albion Pulverising Co. Ltd. —
Allan, John, & Co. (Glenpark), Ltd. .. —
Alley Compressors, Ltd. .. 4
Amafond .. .. .. —
Amber Oils, Ltd. .. .. —
Ambuco Ltd. .. .. —
Anderson-Grice Co., Ltd. .. —
Annealers, Ltd. .. .. —
Armstrong Whitworth (M.I.), Ltd. 5
Ashworth Ross & Co., Ltd. —
Aske, Wm., & Co., Ltd. .. —
Associated Lead Mfts. Ltd. —
Atlas Copco (G.B.), Ltd. .. —
August's, Ltd. 52
Austin, E., & Sons, Ltd. .. —

Badische Maschinenfabrik A.-G. .. .. .. —
Bairds & Scottish Steel, Ltd. 50
Baker Perkins, Ltd. .. 53
Balbardie, Ltd. .. .. —
Ballard, F. J., & Co., Ltd. —
Ballinger, L. J. H., Ltd. .. —
Beans Industries, Ltd. .. —
Beck H. & Sons Ltd. .. 57
Belliss & Morcom, Ltd. .. —
Bennett, H. G., & Co. (Gloves), Ltd. .. .. —
Berk, F. W., & Co., Ltd. .. 68
Bilston Stove & Steel Truck Co., Ltd. .. .. —
Birkett, F. W., & Co., Ltd. —
Birlec-Efco (Melting), Ltd. —
Blackwell's Metallurgical Works, Ltd. 42
Boydell, E., & Co., Ltd. .. —
Bradbury, John & Co. (Stockport), Ltd. .. 62
Bradley & Foster, Ltd. .. —
British Acheson Electrode, Ltd. .. .. .. —
British Aero Components, Ltd. .. .. .. —
British Electrical Repairs, Ltd. .. .. —
British Foundry Units, Ltd. —
British Industrial Sand Ltd. 16
British Iron & Steel Federation .. .. .. —
British Monorail, Ltd. .. —
British Moulding Machine Co., Ltd. .. .. 46 & 47
British Resin Products Ltd. 24
British Ronceray, Ltd. .. —
British Shotblast & Engineering Co., Ltd. .. 65
Broom & Wade, Ltd. .. —
Buckland Sand & Silica Co., Ltd. .. .. .. —
Burn, John, & Co. (B'ham), Ltd. .. .. .. —
Burnand, W. E., & Son, Ltd. —

Canning, W., & Co., Ltd. .. —
Carborundum Co., Ltd. .. —
Catalin, Ltd. .. .. —
Cawood Wharton & Co. Ltd. 62
Chapman & Smith, Ltd. .. —
Chemicals & Feeds, Ltd. .. —
Chetham Timber Co., Ltd. —
Ciba (A.R.L.), Ltd. .. 19
City Casting & Metal Co. Ltd. —
Clayton Crane & Hoist Co. Ltd. —
Cleanair, Ltd. 17
Cohen, Geo., Sons & Co., Ltd. —
Coleman-Wallwork Co. Ltd. —
Consolidated Pneumatic Tool Co., Ltd. 10
Constructional Engineering Co., Ltd., The 67
Controlled Heat & Air, Ltd. —
Conveyor & Shotblast, Ltd. —
Cooke, Bailey, Ltd. .. 58
Cox & Danks, Ltd. .. —
Crockett Lowe, Ltd. .. —
Crooks, L. E. .. .. —
Cumming, Wm., & Co., Ltd. 61

PAGE NOS.

Dallow, Lambert & Co. Ltd. —
Dependable Shell Core Machines Inc. .. .. —
Dernecliff Engineering Pattern Co. 59
Dickson, Roy Wilson, Ltd. —
Distillers Co., Ltd., The .. —
Dowler, H. J., Engineers & Pattern Makers, Ltd. .. 58
Dowson & Mason, Ltd. .. —
Dunford & Elliott (Sheffield), Ltd. 42
Durrans, James & Sons, Ltd. 18
Dustraction, Ltd. .. .. —
Dustuctor Co., Ltd. .. —
Dyson, J. & J., Ltd. .. —

Electrical Development Association .. .. —
Electrogenerators, Ltd. .. —
Elliott Bros. (London), Ltd. —
Elliott, E., Ltd. .. .. —
Engineering Services (Manchester) Ltd. .. .. —
Ertel Ore Ltd. 3
Escol Products, Ltd. .. 48
Evans, James & Co., Ltd. 65
Evans, Roy, M.I.B.F. .. —
Evans, Stanley N., Ltd. .. —
Eyre Smelting Co., Ltd. .. 64

F. & M. Supplies, Ltd. .. —
Feico Hoists, Ltd. 23
Fenton Byrn & Co., Ltd. .. —
Filter-Heat, Ltd. .. .. —
Firth Cleveland Tools, Ltd. —
Fischer, George, Ltd. .. 6
Fisher-Foundries, Ltd. .. —
Fletcher Miller, Ltd. .. —
Flextol Engineering Co., Ltd. —
Fordath Engineering Co., Ltd. 2
Foseco International, Ltd. —
Foseco, Ltd. .. 30 & 31
Foundry Equipment, Ltd. .. 40 & 41
Foundry Mechanisations (Baillot), Ltd. .. .. —
Foundry & Metallurgical Equipment Co., Ltd. .. —
Foundry Plant & Machinery, Ltd. 1
Foundry Suppliers, Ltd. .. —
Foxall, William, Ltd. .. —
Foxboro Yoxall, Ltd. .. —
Frankiss, R. J. (Patterns) Ltd. .. .. .. —
Franklin Furnace, Ltd. .. —
Fuel & Metallurgical Processes, Ltd. .. .. —
Fullers' Earth Union, Ltd., The 14
Furnascote, Ltd. .. .. —

G.W.B. Furnaces, Ltd. .. 21
Gas Council .. .. —
General Refractories, Ltd. —
Goodyear Tyre & Rubber Co., Ltd. .. .. —
Graphite Products, Ltd. .. —
Great Lakes Carbon International, Ltd. .. .. —
Green, E., & Son, Ltd. .. —
Green, Geo., & Co. .. —
Gregory, J. G., & Sons, Ltd. —
Griffiths, A. E. (Smethwick), Ltd. .. .. .. —
Guest, Keen Iron & Steel Works .. .. .. —
Guyson Industrial Equipment Ltd. .. .. .. —

Harborough Construction Co., Ltd. 27
Hargraves Bros. (Manchester), Ltd. .. .. .. —
Harris & Pearson, Ltd. .. 63
Harvey & Longstaffe, Ltd. —
Harvey, J. J. & Pressurecast, Ltd. .. .. .. —
Hedin, Ltd. .. .. —
Heneage Metals, Ltd. .. —
Hepburn Conveyor Co., Ltd. 29
Heywood, S. H., & Co., Ltd. —
High Speed Steel Alloys, Ltd. —
Hills (West Bromwich), Ltd. —

PAGE NOS.

Holman Bros., Ltd. .. .. —
Holmes, W. C., & Co., Ltd. —
Holroyd & Hall, Ltd. .. —
Hooker, N. (Foundry Supplies), Ltd. .. .. —
Hooker, W. J., Ltd. .. —

Ilford, Ltd. .. .. —
Imperial Chemical Industries, Ltd. .. .. —
Incandescent Heat Co., Ltd. —
Ingersoll-Rand Co., Ltd. .. —
International Combustion, Ltd. .. .. .. —

J.S. Pattern Products, Ltd. 58
Jackman, J. W., & Co., Ltd. —
Jacks, Wm., & Co., Ltd. .. 343
Joy Sullivan, Ltd. .. 36

Keith Blackman, Ltd. .. —

L.M.S. Products, Ltd. .. —
Lafarge Aluminous Cement Co., Ltd. .. .. .. —
Laidlaw, Drew & Co., Ltd. —
Leader, Dennis Ltd. .. 62
Lees Hall & Sons, Ltd., .. 59
Leicester Lovell & Co., Ltd. 9
Levy, B., & Co. (Patterns), Ltd. 58
Lones, Joseph, Laboratories —
Lord, E. S., Ltd. 64
Luke & Spencer, Ltd. .. —

Macnab & Co., Ltd. .. —
Major, Robinson & Co., Ltd. —
Mansfield Standard Sand Co., Ltd. 48
Marco Conveyor & Eng'g. Co., Ltd. .. .. .. —
Marshall, Thomas (Loxley), Ltd. 341
Matthews & Yates, Ltd. .. —
May, J. H., Ltd. .. .. —
Mead, McLean & Co., Ltd. 64
Mellor Mineral Mills, Ltd. —
Metalectric Furnaces, Ltd. 35
Metals & Equipment (Wolverhampton), Ltd. .. —
Midgley & Son, Ltd. .. —
Midland Monolithic Furnace Linings Co., Ltd. .. 65
Midland Tar Distillers, Ltd. —
Modern Furnaces & Stoves, Ltd. 22
Molineux Foundry Equipment, Ltd. .. .. —
Monometer Manufacturing Co., Ltd. .. .. —
Morganite Crucible, Ltd. .. 28

Newton Collins, Ltd. .. —
Nicholl & Wood, Ltd. .. —
Norris Equipment & Construction, Ltd. .. .. —
North Derbyshire Metal Products, Ltd. 43
Norton Grinding Wheel Company, Ltd. .. .. —
Norton Industries, Ltd. .. 61
Ormerod, R. E., Ltd. .. 65
Orthos, Ltd. 59

Palmer Aero Products, Ltd. —
Parish, J., & Co., Ltd. .. —
Park & Paterson, Ltd. .. 25
Parker Mitchell Engineering Co., Ltd. .. .. .. —
Parmelee (G.B.), Ltd. .. —
Passe, J. F., Co. .. .. —
Paterson Hughes Engineering Co., Ltd. .. .. 38 & 39
Patterncrafts, Ltd. .. —
Pearson, E. J. & J., Ltd. .. —
Peco Machinery Sales, Ltd. 28
Perry, G., & Sons, Ltd. 58
Phillips, J. W. & C. J., Ltd. —
Pickard, W., & Co., Ltd. .. —
Pickford, Holland, Ltd. .. —
Platt Metals, Ltd. .. .. —
Pneulec, Ltd. 7
Polygram Castings Co., Ltd. 20
Precision Presswork Co. Ltd. —
Price, J. T., & Co., Ltd. .. —
Production Chemicals (Rochdale), Ltd. .. .. —
Purimachos, Ltd. .. .. —

PAGE NOS.

Reavell & Co., Ltd. .. .. —
Refined Iron Co. (Darwen), Ltd. .. .. .. —
Reid, Wm., & Co. 65
Resinous Chemicals, Ltd. —
Richards Structural Steel Co., Ltd. .. .. .. —
Richardson Eng'g. Ltd. .. —
Richardsons Moss Litter Co., Ltd. .. .. .. —
Richardsons, R. J., & Sons, Ltd. .. .. .. —
Ridsdale & Co., Ltd. .. —
Robinson, Thos., & Son, Ltd. 37
Robson Refractories, Ltd. —
Roper, E. A., & Co., Ltd. .. —
Rowland, F. E., & Co., Ltd. —
Rubery Owen & Co., Ltd. .. —
Rule & Moffat .. .. —
Rustless Iron Co., Ltd. .. —

Safety Products, Ltd. .. —
Salter, Geo., & Co., Ltd. .. —
Schicldrop & Co., Ltd. .. —
St. George's Engineers, Ltd. —
Sheffield Smelting Co., Ltd. —
Sheppard & Co., Ltd. .. —
Sieber, J., Equipment Co., Ltd. .. .. .. —
Sintokogio, Ltd. 63
Smedley Bros., Ltd. .. —
Smeeton, J. A., Ltd. .. —
Smith, A., & Co. .. .. —
Smith, A. (S. & B. Foundry Sands), Ltd. .. .. —
Smith, John (Keighley), Ltd. —
Smiths Motor Accessories, Ltd. 343
Soles, J. M. .. .. —
Spencer & Halstead, Ltd. .. 44
Spermolin, Ltd. .. .. —
Stansby, W., & Co., Ltd. .. —
Stanton & Staveley Sales, Ltd. 45
Steels Engineering Installations .. .. .. —
Stein, John G., & Co., Ltd. 33
Stephens, Wm. & Sons, Ltd. —
Sterling Foundry Specialties, Ltd. .. .. 12 & 13
Sternol, Ltd. .. .. —
Stone, J., & Co. (Propellers) Ltd. .. .. .. —
Suffolk Iron Foundry (1920), Ltd. 64
Sutcliffe Speakman, Ltd. .. —

Taylor, J. (Syston), Ltd. .. —
Thomas, G. & R., Ltd. .. 15
Thomas, Gwyn, & Co. .. —
Thompson, John, Instrument Co., Ltd. .. .. —
Thomson & McIntyre .. —
Thor Tools, Ltd. 32
Tilghman's, Ltd. .. .. —

Union Carbide, Ltd. .. —
Unit Engineering Co. .. —
United Fireclay Products, Ltd. 8
United States Metallic Packing Co., Ltd. .. .. —

Verrolec, Ltd. .. .. —
Victor Products, Ltd. .. —

Wagner Heinrich, Maschinenfabrik 59
Wal-Met Alloys Co. .. 34
Walker, I. & I., Ltd. .. —
Ward, Thos. W., Ltd. .. —
Warner & Co., Ltd. .. —
Warrington Red Moulding Sand Co. .. .. —
Watsons (Metallurgists) Ltd. —
West Midland Refining Co., Ltd. .. .. .. —
Wild-Barfield Electric Furnaces, Ltd. .. .. —
Wilkinson Rubber-Linatex Co., Ltd. 62
Wilson Crucible Co., Ltd. 65
Witham, L. A., & Co. .. —
Woking Pattern Works, Ltd. —
Woodward Bros. & Copelin, Ltd. .. .. .. —

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